

OM-189 424E

August 1998

Processes



MIG (GMAW) Welding
Flux Cored (FCAW) Welding

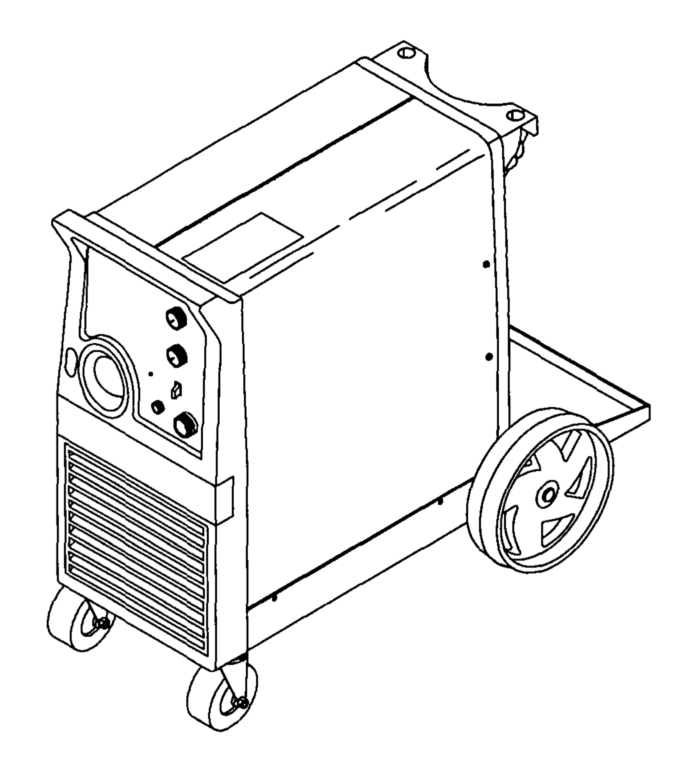
Description





Arc Welding Power Source
and Wire Feeder

Millermatic® 400





Visit our website at
www.MillerWelds.com

OWNER'S MANUAL

From Miller to You

Thank you and *congratulations* on choosing Miller. Now you can get the job done and get it done right. We know you don't have time to do it any other way.



That's why when Niels Miller first started building arc welders in 1929, he made sure his products offered long-lasting value and superior quality. Like you, his customers couldn't afford anything less. Miller products had to be more than the best they could be. They had to be the best you could buy.

Today, the people that build and sell Miller products continue the tradition. They're just as committed to providing equipment and service that meets the high standards of quality and value established in 1929.

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards on the worksite. We've made installation and operation quick and easy. With Miller you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is. The parts list will then help you to decide which exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.

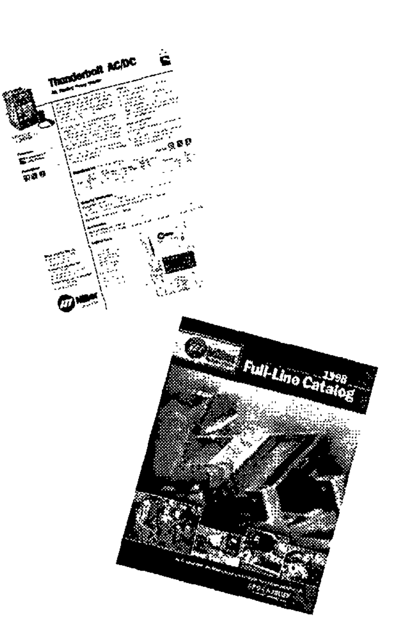


Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001 Quality System Standard.

TRUE BLUE® WARRANTY

Working as hard as you do - every power source from Miller is backed by the most hassle-free warranty in the business.

Miller offers a Technical Manual which provides more detailed service and parts information for your unit. To obtain a Technical Manual, contact your local distributor. Your distributor can also supply you with Welding Process Manuals such as SMAW, GTAW, GMAW, and GMAW-P.



Miller Electric manufactures a full line of welders and welding related equipment. For information on other quality Miller products, contact your local Miller distributor to receive the latest full line catalog or individual catalog sheets. To locate your nearest distributor call 1-800-4-A-Miller.



The following term is used interchangeably throughout this manual: MIG=GMAW

TABLE OF CONTENTS

SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

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1-1. Symbol Usage



Means Warning! Watch Out! There are possible hazards with this procedure! The possible hazards are shown in the adjoining symbols.

▲ **Marks a special safety message.**

☞ *Means "Note"; not safety related.*

This group of symbols means Warning! Watch Out! possible ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

1-2. Arc Welding Hazards

▲ **The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-4. Read and follow all Safety Standards.**

▲ **Only qualified persons should install, operate, maintain, and repair this unit.**

▲ **During operation, keep everybody, especially children, away.**

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground - check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first - double-check connections.
- Frequently inspect input power cord for damage or bare wiring - replace cord immediately if damaged - bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable - do not use work clamp or work cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal.

SIGNIFICANT DC VOLTAGE exists after removal of input power on inverters.

- Turn Off inverter, disconnect input power, and discharge input capacitors according to instructions in Maintenance Section before touching any parts.



FUMES AND GASES can be hazardous.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
- If ventilation is poor, use an approved air-supplied respirator.
- Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.



ARC RAYS can burn eyes and skin.

Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

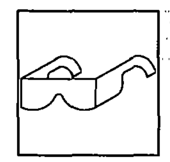
- Wear a welding helmet fitted with a proper shade of filter to protect your face and eyes when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (leather and wool) and foot protection.



WELDING can cause fire or explosion.

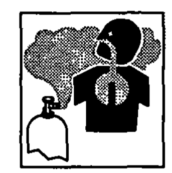
Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

- Protect yourself and others from flying sparks and hot metal.
- Do not weld where flying sparks can strike flammable material.
- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.



FLYING METAL can injure eyes.

- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.



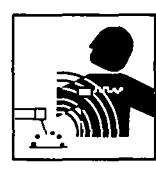
BUILDUP OF GAS can injure or kill.

- Shut off shielding gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.



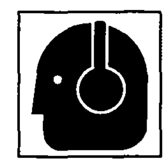
HOT PARTS can cause severe burns.

- Do not touch hot parts bare handed.
- Allow cooling period before working on gun or torch.



MAGNETIC FIELDS can affect pacemakers.

- Pacemaker wearers keep away.
- Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.



NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.



CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

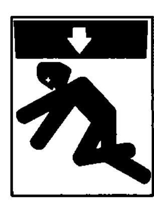
- Protect compressed gas cylinders from excessive heat, mechanical shocks, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder - explosion will result.
- Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

1-3. Additional Symbols For Installation, Operation, And Maintenance



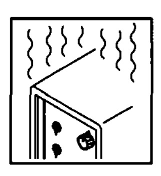
FIRE OR EXPLOSION hazard.

- Do not install or place unit on, over, or near combustible surfaces.
- Do not install unit near flammables.
- Do not overload building wiring - be sure power supply system is properly sized, rated, and protected to handle this unit.



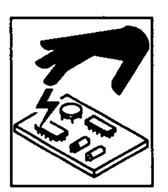
FALLING UNIT can cause injury.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
- Use equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.



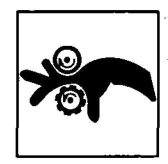
OVERUSE can cause OVERHEATING

- *Allow cooling period; follow rated duty cycle.*
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.



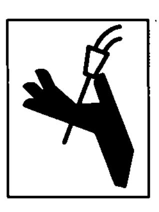
STATIC (ESD) can damage PC boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.



MOVING PARTS can cause injury.

- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.



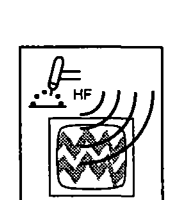
WELDING WIRE can cause injury.

- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people, or any metal when threading welding wire.



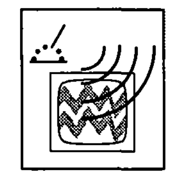
MOVING PARTS can cause injury.

- Keep away from moving parts such as fans.
- Keep all doors, panels, covers, and guards closed and securely in place.



H.F. RADIATION can cause interference.

- High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
- Have only qualified persons familiar with electronic equipment perform this installation.
- The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- If notified by the FCC about interference, stop using the equipment at once.
- *Have the installation regularly checked and maintained.*
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.



ARC WELDING can cause interference.

- Electromagnetic energy can interfere with sensitive electronic equipment such as computers and computer-driven equipment such as robots.
- Be sure all equipment in the welding area is electromagnetically compatible.
- To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor.
- Locate welding operation 100 meters from any sensitive electronic equipment.
- Be sure this welding machine is installed and grounded according to this manual.
- If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.

1-4. Principal Safety Standards

Safety in Welding and Cutting, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami FL 33126

Safety and Health Standards, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting And Welding Processes, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

1-5. EMF Information

Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields

Welding current, as it flows through welding cables, will cause electromagnetic fields. There has been and still is some concern about such fields. However, after examining more than 500 studies spanning 17 years of research, a special blue ribbon committee of the National Research Council concluded that: "The body of evidence, in the committee's judgment, has not demonstrated that exposure to power-frequency electric and magnetic fields is a human-health hazard." However, studies are still going forth and evidence continues to be examined. Until the final conclusions of the research are reached, you may wish to minimize your exposure to electromagnetic fields when welding or cutting.

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep welding power source and cables as far away from operator as practical.
5. Connect work clamp to workpiece as close to the weld as possible.

About Pacemakers:

Pacemaker wearers consult your doctor first. If cleared by your doctor, then following the above procedures is recommended.

SECTION 1 - CONSIGNES DE SECURITE - LIRE AVANT UTILISATION

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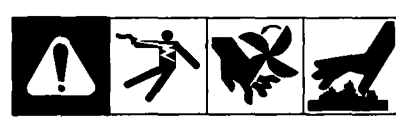
1-1. Signification des symboles



Signifie Mise en garde ! Soyez vigilant ! Cette procédure présente des risques de danger ! Ceux-ci sont identifiés par des symboles adjacents aux directives.

▲ **Identifie un message de sécurité particulier.**

☞ *Signifie NOTA ; n'est pas relatif à la sécurité.*



Ce groupe de symboles signifie Mise en garde ! Soyez vigilant ! Il y a des risques de danger reliés aux CHOCS ÉLECTRIQUES, aux PIÈCES EN MOUVEMENT et aux PIÈCES CHAUDES. Reportez-vous aux symboles et aux directives ci-dessous afin de connaître les mesures à prendre pour éviter tout danger.

1-2. Dangers relatifs au soudage à l'arc

▲ **Les symboles présentés ci-après sont utilisés tout au long du présent manuel pour attirer votre attention et identifier les risques de danger. Lorsque vous voyez un symbole, soyez vigilant et suivez les directives mentionnées afin d'éviter tout danger. Les consignes de sécurité présentées ci-après ne font que résumer l'information contenue dans les normes de sécurité énumérées à la section 1-4. Veuillez lire et respecter toutes ces normes de sécurité.**

▲ **L'installation, l'utilisation, l'entretien et les réparations ne doivent être confiés qu'à des personnes qualifiées.**

▲ **Au cours de l'utilisation, tenir toute personne à l'écart et plus particulièrement les enfants.**



UN CHOC ÉLECTRIQUE peut tuer.

Un simple contact avec des pièces électriques peut provoquer une électrocution ou des blessures graves. L'électrode et le circuit de soudage sont sous tension dès que l'appareil est sur ON. Le circuit d'entrée et les circuits internes de l'appareil sont également sous tension à ce moment-là. En soudage semi-automatique ou automatique, le fil, le dévidoir, le logement des galets d'entraînement et les pièces métalliques en contact avec le fil de soudage sont sous tension. Des matériels mal installés ou mal mis à la terre présentent un danger.

- Ne jamais toucher les pièces électriques sous tension.
- Porter des gants et des vêtements de protection secs ne comportant pas de trous.
- S'isoler de la pièce et de la terre au moyen de tapis ou d'autres moyens isolants suffisamment grands pour empêcher le contact physique éventuel avec la pièce ou la terre.
- Ne pas se servir de source électrique àcourant électrique dans les zones humides, dans les endroits confinés ou là où on risque de tomber.
- Se servir d'une source électrique àcourant électrique UNIQUEMENT si le procédé de soudage le demande.
- Si l'utilisation d'une source électrique àcourant électrique s'avère nécessaire, se servir de la fonction de télécommande si l'appareil en est équipé.
- Couper l'alimentation ou arrêter le moteur avant de procéder à l'installation, à la réparation ou à l'entretien de l'appareil. Déverrouiller l'alimentation selon la norme OSHA 29 CFR 1910.147 (voir normes de sécurité).
- Installer et mettre à la terre correctement cet appareil conformément à son manuel d'utilisation et aux codes nationaux, provinciaux et municipaux.
- Toujours vérifier la terre du cordon d'alimentation - Vérifier et s'assurer que le fil de terre du cordon d'alimentation est bien raccordé à la borne de terre du sectionneur ou que la fiche du cordon est raccordée à une prise correctement mise à la terre.
- En effectuant les raccordements d'entrée fixer d'abord le conducteur de mise à la terre approprié et contre-vérifier les connexions.
- Vérifier fréquemment le cordon d'alimentation pour voir s'il n'est pas endommagé ou dénudé - remplacer le cordon immédiatement s'il est endommagé - un câble dénudé peut provoquer une électrocution.
- Mettre l'appareil hors tension quand on ne l'utilise pas.
- Ne pas utiliser des câbles usés, endommagés, de grosseur insuffisante ou mal épissés.
- Ne pas enrouler les câbles autour du corps.
- Si la pièce soudée doit être mise à la terre, le faire directement avec un câble distinct - ne pas utiliser le connecteur de pièce ou le câble de retour.
- Ne pas toucher l'électrode quand on est en contact avec la pièce, la terre ou une électrode provenant d'une autre machine.
- N'utiliser qu'un matériel en bon état. Réparer ou remplacer sur-le-champ les pièces endommagées. Entretenir l'appareil conformément à ce manuel.
- Porter un harnais de sécurité quand on travaille en hauteur.
- Maintenir solidement en place tous les panneaux et capots.
- Fixer le câble de retour de façon à obtenir un bon contact métal-métal avec la pièce à souder ou la table de travail, le plus près possible de la soudure.
- Isoler la pince de masse quand pas mis à la pièce pour éviter le contact avec tout objet métallique.

Il y a DU COURANT CONTINU IMPORTANT dans les convertisseurs après la suppression de l'alimentation électrique.

- Arrêter les convertisseurs, débrancher le courant électrique, et décharger les condensateurs d'alimentation selon les instructions indiquées dans la partie entretien avant de toucher les pièces.



LES FUMÉES ET LES GAZ peuvent être dangereux.

Le soudage génère des fumées et des gaz. Leur inhalation peut être dangereux pour votre santé.

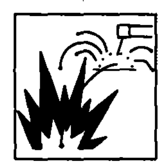
- Eloigner votre tête des fumées. Ne pas respirer les fumées.
- A l'intérieur, ventiler la zone et/ou utiliser un échappement au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage.
- Si la ventilation est insuffisante, utiliser un respirateur à alimentation d'air homologué.
- Lire les spécifications de sécurité des matériaux (MSDSs) et les instructions du fabricant concernant les métaux, les consommables, les revêtements, les nettoyants et les dégraisseurs.
- Travailler dans un espace fermé seulement s'il est bien ventilé ou en portant un respirateur à alimentation d'air. Demander toujours à un surveillant dûment formé de se tenir à proximité. Des fumées et des gaz de soudage peuvent déplacer l'air et abaisser le niveau d'oxygène provoquant des blessures ou des accidents mortels. S'assurer que l'air de respiration ne présente aucun danger.
- Ne pas souder dans des endroits situés à proximité d'opérations de dégraissage, de nettoyage ou de pulvérisation. La chaleur et les rayons de l'arc peuvent réagir en présence de vapeurs et former des gaz hautement toxiques et irritants.
- Ne pas souder des métaux munis d'un revêtement, tels que l'acier galvanisé, plaqué en plomb ou au cadmium à moins que le revêtement n'ait été enlevé dans la zone de soudure, que l'endroit soit bien ventilé, et si nécessaire, en portant un respirateur à alimentation d'air. Les revêtements et tous les métaux renfermant ces éléments peuvent dégager des fumées toxiques en cas de soudage.



LES RAYONS DE L'ARC peuvent provoquer des brûlures dans les yeux et sur la peau.

Le rayonnement de l'arc du procédé de soudage génère des rayons visibles et invisibles intenses (ultraviolets et infrarouges) susceptibles de provoquer des brûlures dans les yeux et sur la peau. Des étincelles sont projetées pendant le soudage.

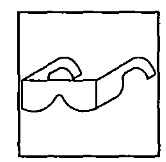
- Porter un casque de soudage muni d'un écran de filtre approprié pour protéger votre visage et vos yeux pendant le soudage ou pour regarder (voir ANSI Z49.1 et Z87.1 énuméré dans les normes de sécurité).
- Porter des protections approuvés pour les oreilles si le niveau sondre est trop élevé.
- Utiliser des écrans ou des barrières pour protéger des tiers de l'éclair et de l'éblouissement; demander aux autres personnes de ne pas regarder l'arc.
- Porter des vêtements de protection constitué dans une matière durable, résistant au feu (cuir ou laine) et une protection des pieds.



LE SOUDAGE peut provoquer un incendie ou une explosion.

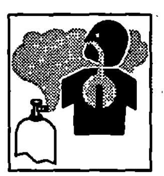
Le soudage effectué sur des conteneurs fermés tels que des réservoirs, tambours ou des conduites peut provoquer leur éclatement. Des étincelles peuvent être projetées de l'arc de soudure. La projection d'étincelles, des pièces chaudes et des équipements chauds peut provoquer des incendies et des brûlures. Le contact accidentel de l'électrode avec des objets métalliques peut provoquer des étincelles, une explosion, un surchauffement ou un incendie. Avant de commencer le soudage, vérifier et s'assurer que l'endroit ne présente pas de danger.

- Se protéger et d'autres personnes de la projection d'étincelles et de métal chaud.
- Ne pas souder dans un endroit là où des étincelles peuvent tomber sur des substances inflammables.
- Déplacer toutes les substances inflammables à une distance de 10,7 m de l'arc de soudage. En cas d'impossibilité les recouvrir soigneusement avec des protections homologués.
- Des étincelles et des matériaux chauds du soudage peuvent facilement passer dans d'autres zones en traversant de petites fissures et des ouvertures.
- Surveiller tout déclenchement d'incendie et tenir un extincteur à proximité.
- Le soudage effectué sur un plafond, plancher, paroi ou séparation peut déclencher un incendie de l'autre côté.
- Ne pas effectuer le soudage sur des conteneurs fermés tels que des réservoirs, tambours, ou conduites, à moins qu'ils n'aient été préparés correctement conformément à AWS F4.1 (voir les normes de sécurité).
- Brancher le câble sur la pièce le plus près possible de la zone de soudage pour éviter le transport du courant sur une longue distance par des chemins inconnus éventuels en provoquant des risques d'électrocution et d'incendie.
- Ne pas utiliser le poste de soudage pour dégeler des conduites gelées.
- En cas de non utilisation, enlever la baguette d'électrode du porte-électrode ou couper le fil à la pointe de contact.
- Porter des vêtements de protection dépourvus d'huile tels que des gants en cuir, une chemise en matériau lourd, des pantalons sans revers, des chaussures hautes et un couvre chef.
- Avant de souder, retirer toute substance combustible de vos poches telles qu'un allumeur au butane ou des allumettes.



DES PARTICULES VOLANTES peuvent blesser les yeux.

- Le soudage, l'écaillement, le passage de la pièce à la brosse en fil de fer, et le meulage génèrent des étincelles et des particules métalliques volantes. Pendant la période de refroidissement des soudures, elles risquent de projeter du laitier.
- Porter des lunettes de sécurité avec écrans latéraux ou un écran facial.



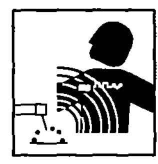
LES ACCUMULATIONS DE GAZ risquent de provoquer des blessures ou même la mort.

- Fermer l'alimentation du gaz protecteur en cas de non utilisation.
- Veiller toujours à bien aérer les espaces confinés ou se servir d'un respirateur d'adduction d'air homologué.



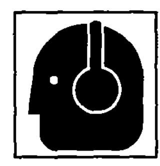
DES PIÈCES CHAUDES peuvent provoquer des brûlures graves.

- Ne pas toucher des parties chaudes à mains nues
- Prévoir une période de refroidissement avant d'utiliser le pistolet ou la torche.



LES CHAMPS MAGNÉTIQUES peuvent affecter les stimulateurs cardiaques.

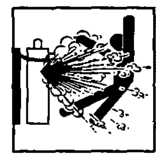
- Porteurs de stimulateur cardiaque, restez à distance.
- Les porteurs d'un stimulateur cardiaque doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de gougeage ou de soudage par points.



LE BRUIT peut affecter l'ouïe.

Le bruit des processus et des équipements peut affecter l'ouïe.

- Porter des protections approuvés pour les oreilles si le niveau sondre est trop élevé.



Si des BOUTEILLES sont endommagées, elles pourront exploser.

Des bouteilles de gaz protecteur contiennent du gaz sous haute pression. Si une bouteille est endommagée, elle peut exploser. Du fait que les bouteilles de gaz font normalement partie du procédé de soudage, les manipuler avec précaution.

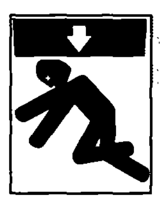
- Protéger les bouteilles de gaz comprimé d'une chaleur excessive, des chocs mécaniques, du laitier, des flammes ouvertes, des étincelles et des arcs.
- Placer les bouteilles debout en les fixant dans un support stationnaire ou dans un porte-bouteilles pour les empêcher de tomber ou de se renverser.
- Tenir les bouteilles éloignées des circuits de soudage ou autres circuits électriques.
- Ne jamais placer une torche de soudage sur une bouteille à gaz.
- Une électrode de soudage ne doit jamais entrer en contact avec une bouteille.
- Ne jamais souder une bouteille pressurisée - risque d'explosion.
- Utiliser seulement des bouteilles de gaz protecteur, régulateurs, tuyaux et raccords convenables pour cette application spécifique; les maintenir ainsi que les éléments associés en bon état.
- Ne pas tenir la tête en face de la sortie en ouvrant la soupape de la bouteille.
- Maintenir le chapeau de protection sur la soupape, sauf en cas d'utilisation ou de branchement de la bouteille.
- Lire et suivre les instructions concernant les bouteilles de gaz comprimé, les équipements associés et les publications P-1 CGA énumérées dans les normes de sécurité.

1-3. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance



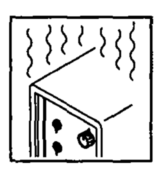
Risque D'INCENDIE OU D'EXPLOSION.

- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces infllammables.
- Ne pas installer l'appareil à proximité de produits inflammables
- Ne pas surcharger l'installation électrique - s"assurer que l'alimentation est correctement dimensionné et protégé avant de mettre l'appareil en service.



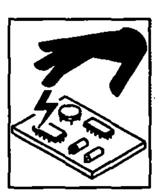
LA CHUTE DE L'APPAREIL peut blesser.

- Utiliser l'anneau de levage uniquement pour soulever l'appareil, NON PAS les chariot, les bouteilles de gaz ou tout autre accessoire.
- Utiliser un engin d'une capacité appropriée pour soulever l'appareil.
- En utilisant des fourches de levage pour déplacer l'unité, s'assurer que les fourches sont suffisamment longues pour dépasser du côté opposé de l'appareil.



L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

- Prévoir une période de refroidissement, respecter le cycle opératoire nominal.
- Réduire le courant ou le cycle opératoire avant de recommancer le soudage.
- Ne pas obstruer les passages d'air du poste.



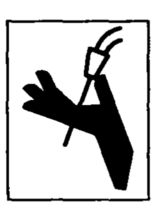
LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

- Établir la connexion avec la barrette de terre avant de manipuler des cartes ou des pièces.
- Utiliser des pochettes et des boîtes antistatiques pour stocker, déplacer ou expédier des cartes de circuits imprimes.



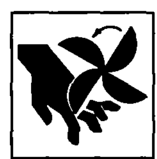
DES ORGANES MOBILES peuvent provoquer des blessures.

- Ne pas s'approcher des organes mobiles.
- Ne pas s'approcher des points de coincement tels que des rouleaux de commande.



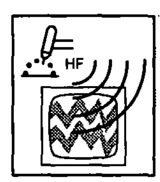
LES FILS DE SOUDAGE peuvent provoquer des blessures.

- Ne pas appuyer sur la gachette avant d'en avoir reçu l'instruction.
- Ne pas diriger le pistolet vers soi, d'autres personnes ou toute pièce mécanique en engageant le fil de soudage.



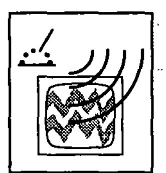
DES ORGANES MOBILES peuvent provoquer des blessures.

- Rester à l'écart des organes mobiles comme le ventilateur.
- Maintenir fermés et fixement en place les portes, panneaux, recouvrements et dispositifs de protection.



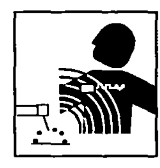
LE RAYONNEMENT HAUTE FRÉQUENCE (H.F.) risque de provoquer des interférences.

- Le rayonnement haute frequence peut provoquer des interférences avec les équipements de radio-navigation et de communication, les services de sécurité et les ordinateurs.
- Demander seulement à des personnes qualifiées familiarisées avec des équipements électroniques de faire fonctionner l'installation.
- L'utilisateur est tenu de faire corriger rapidement par un électricien qualifié les interférences résultant de l'installation.
- Si le FCC signale des interférences, arrêter immédiatement l'appareil.
- Effectuer régulièrement le contrôle et l'entretien de l'installation.
- Maintenir soigneusement fermés les portes et les panneaux des sources de haute fréquence, maintenir les éclateurs à une distance correcte et utiliser une terre et et un blindage pour réduire les interférences éventuelles.



LE SOUDAGE À L'ARC risque de provoquer des interférences.

- L'énergie électromagnétique risque de provoquer des interferences pour l'équipement électronique sensible tel que les ordinateurs et l'équipement commandé par ordinateur tel que les robots.
- Veiller à ce que tout l'équipement de la zone de soudage soit compatible électromagnétiquement.
- Pour réduire la possibilité d'interférence, maintenir les câbles de soudage aussi courts que possible, les grouper, et les poser aussi bas que possible (ex. par terre).
- Veiller à souder à une distance de 100 mètres de tout équipement électronique sensible.
- Veiller à ce que ce poste de soudage soit posé et mis à la terre conformément à ce mode d'emploi.
- En cas d'interférences après avoir pris les mesures précédentes, il incombe à l'utilisateur de prendre des mesures supplémentaires telles que le déplacement du poste, l'utilisation de câbles blindés, l'utilisation de filtres de ligne ou la pose de protecteurs dans la zone de travail.



LES CHAMPS MAGNÉTIQUES peuvent affecter les stimulateurs cardiaques.

- Porteurs de stimulateur cardiaque, restez à distance.
- Les porteurs d'un stimulateur cardiaque doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de gougeage ou de soudage par points.

1-4. Principales normes de sécurité

Safety in Welding and Cutting, norme ANSI Z49.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

Safety and Health Sandards, OSHA 29 CFR 1910, du Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practice for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, norme AWS F4.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

National Electrical Code, NFPA Standard 70, de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, de la Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Règles de sécurité en soudage, coupage et procédés connexes, norme CSA W117.2, de l'Association canadienne de normalisation, vente de normes, 178 Rexdale Boulevard, Rexdale (Ontario) Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, norme ANSI Z87.1, de l'American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting and Welding Processes, norme NFPA 51B, de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

1-5. Information sur les champs électromagnétiques

Données sur le soudage électrique et sur les effets, pour l'organisme, des champs magnétiques basse fréquence

Le courant de soudage, pendant son passage dans les câbles de soudage, causera des champs électromagnétiques. Il y a eu et il y a encore un certain souci à propos de tels champs. Cependant, après avoir examiné plus de 500 études qui ont été faites pendant une période de recherche de 17 ans, un comité spécial ruban bleu du National Research Council a conclu: "L'accumulation de preuves, suivant le jugement du comité, n'a pas démontré que l'exposition aux champs magnétiques et champs électriques à haute fréquence représente un risque à la santé humaine". Toutefois, des études sont toujours en cours et les preuves continuent à être examinées. En attendant que les conclusions finales de la recherche soient établies, il vous serait souhaitable de réduire votre exposition aux champs électromagnétiques pendant le soudage ou le coupage.

Afin de réduire les champs électromagnétiques dans l'environnement de travail, respecter les consignes suivantes :

1 Garder les câbles ensembles en les torsadant ou en les attachant avec du ruban adhésif.
2 Mettre tous les câbles du côté opposé de l'opérateur.
3 Ne pas courber pas et ne pas entourer pas les câbles autour de votre corps.
4 Garder le poste de soudage et les câbles le plus loin possible de vous.
5 Relier la pince de masse le plus près possible de la zone de soudure.

Consignes relatives aux stimulateurs cardiaques :

Les personnes qui portent un stimulateur cardiaque doivent avant tout consulter leur docteur. Si vous êtes déclaré apte par votre docteur, il est alors recommandé de respecter les consignes ci-dessus.

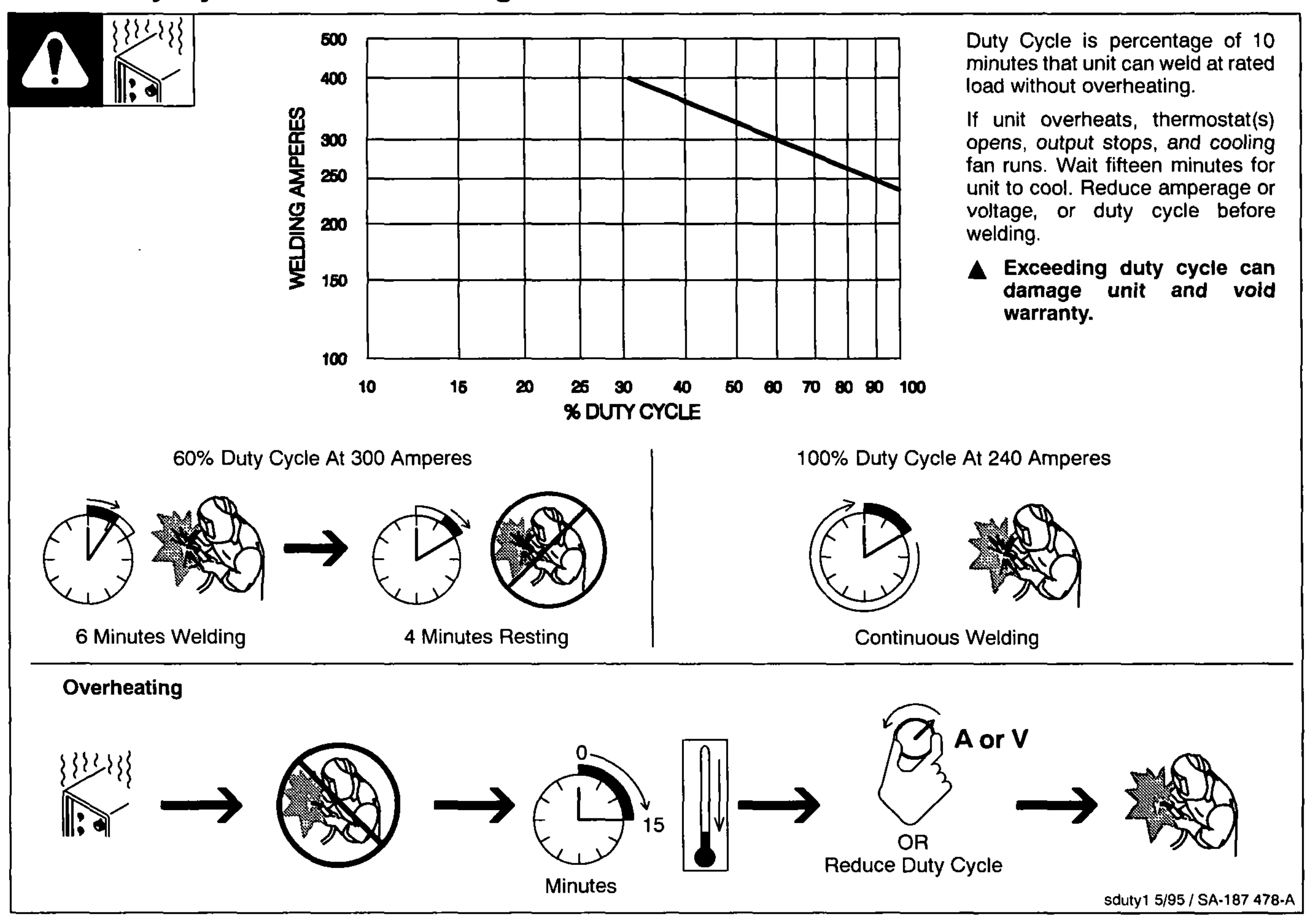
SECTION 2 - INSTALLATION

2-1. Specifications

Rated Output		Max. Open Circuit Voltage	Amps Input at Rated Output, 50 or 60 Hz			
			230 V	400 V	KVA	KW
300 A at 32 VDC, 60% Duty Cycle	240 A at 32 VDC, 100% Duty Cycle	38	44.4	25.5	17.9	12.7

Wire Type and Diameter			Wire Feed Speed	Dimensions	Net Weight
Solid Steel	Stainless Steel	Flux Cored	50-670 IPM (1.2-1.7 m/min)	H: 37 in (940 mm) W: 19 in (483 mm) D: 30-1/4 in (768 mm)	275 lb (125 kg)
.023 - 1/16 in (0.6 - 1.6 mm)	.023 - .035 in (0.6 - 0.9 mm)	.030 - 1/16 in (0.8 - 1.6 mm)			

2-2. Duty Cycle And Overheating



Duty Cycle is percentage of 10 minutes that unit can weld at rated load without overheating.

If unit overheats, thermostat(s) opens, output stops, and cooling fan runs. Wait fifteen minutes for unit to cool. Reduce amperage or voltage, or duty cycle before welding.

▲ **Exceeding duty cycle can damage unit and void warranty.**

2-3. Volt-Ampere Curve

1 Normal Volt-Ampere Curves

The volt-ampere curves show the normal minimum and maximum voltage and amperage output capabilities of the welding power source. Curves of other settings fall between the curves shown.

2 Overload Volt-Ampere Curves

When unit is used beyond capacity, circuitry senses the overload and shuts down unit output. Release trigger and lower weld voltage setting before trying to weld. This shut down circuitry protects internal circuits and parts from overload damage.

ST-189 478

2-4. Installing Work Clamp

1 Work Cable

2 Boot

Slide boot onto work cable. Route cable out front panel opening from inside.

3 Negative (-) Output Terminal

Connect cable to terminal and cover connection with boot.

4 Hardware

5 Work Clamp

Route cable through clamp handle and secure as shown.

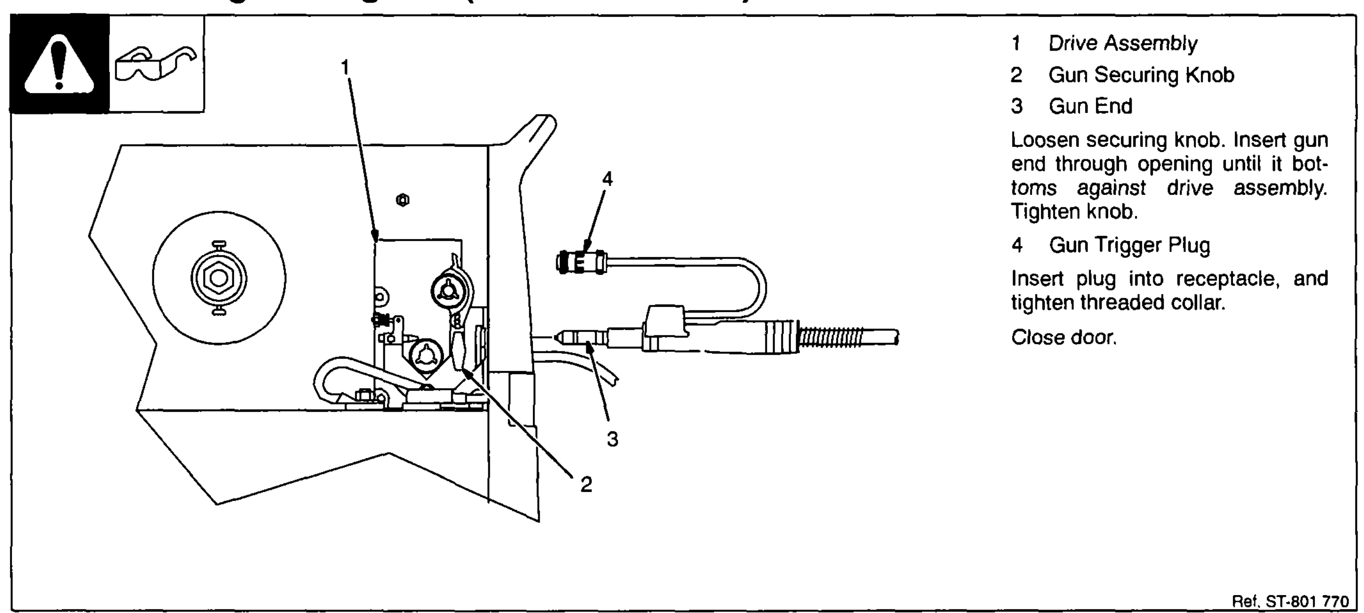
Close door.

Tools Needed:

1/2, 3/4 in

ST-801 955

2-5. Installing Welding Gun (Gun Not Included)



1 Drive Assembly
2 Gun Securing Knob
3 Gun End

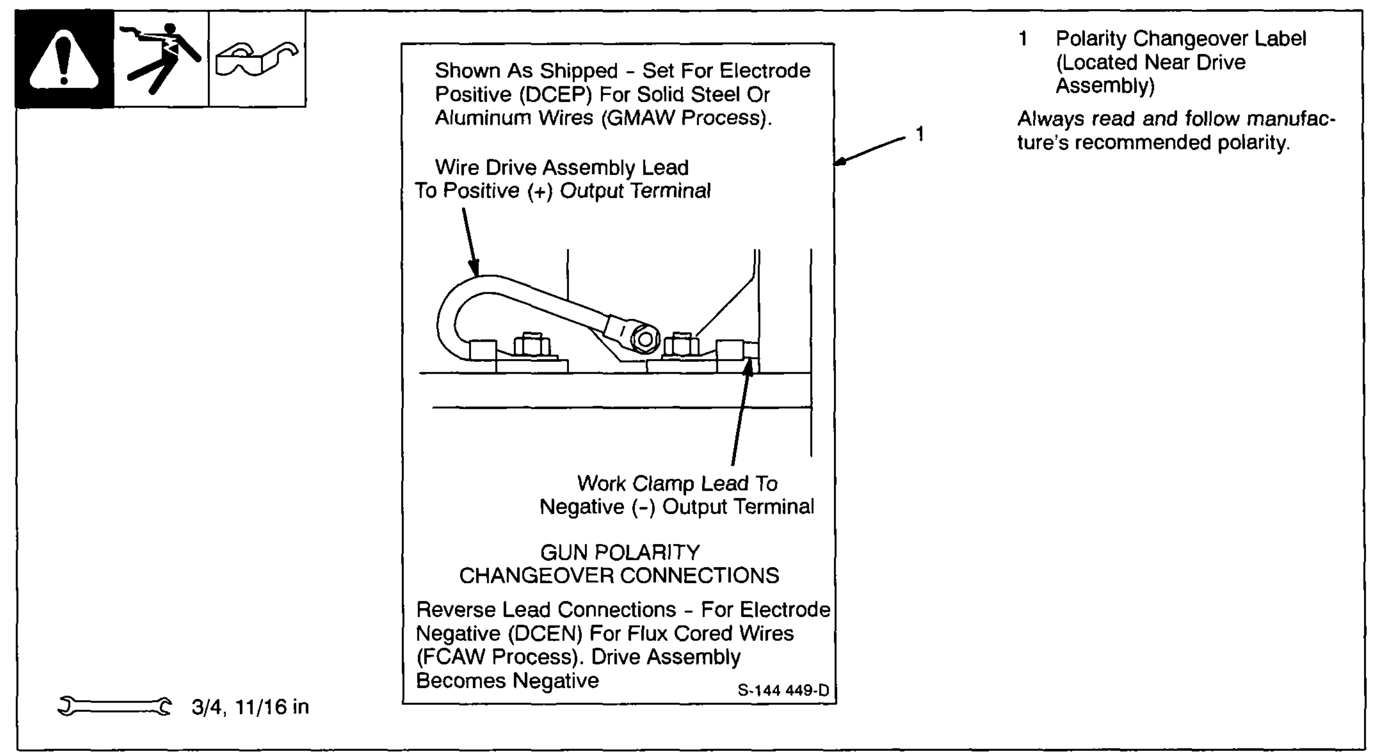
Loosen securing knob. Insert gun end through opening until it bottoms against drive assembly. Tighten knob.

4 Gun Trigger Plug

Insert plug into receptacle, and tighten threaded collar.

Close door.

2-6. Setting Gun Polarity For Wire Type



1 Polarity Changeover Label (Located Near Drive Assembly)

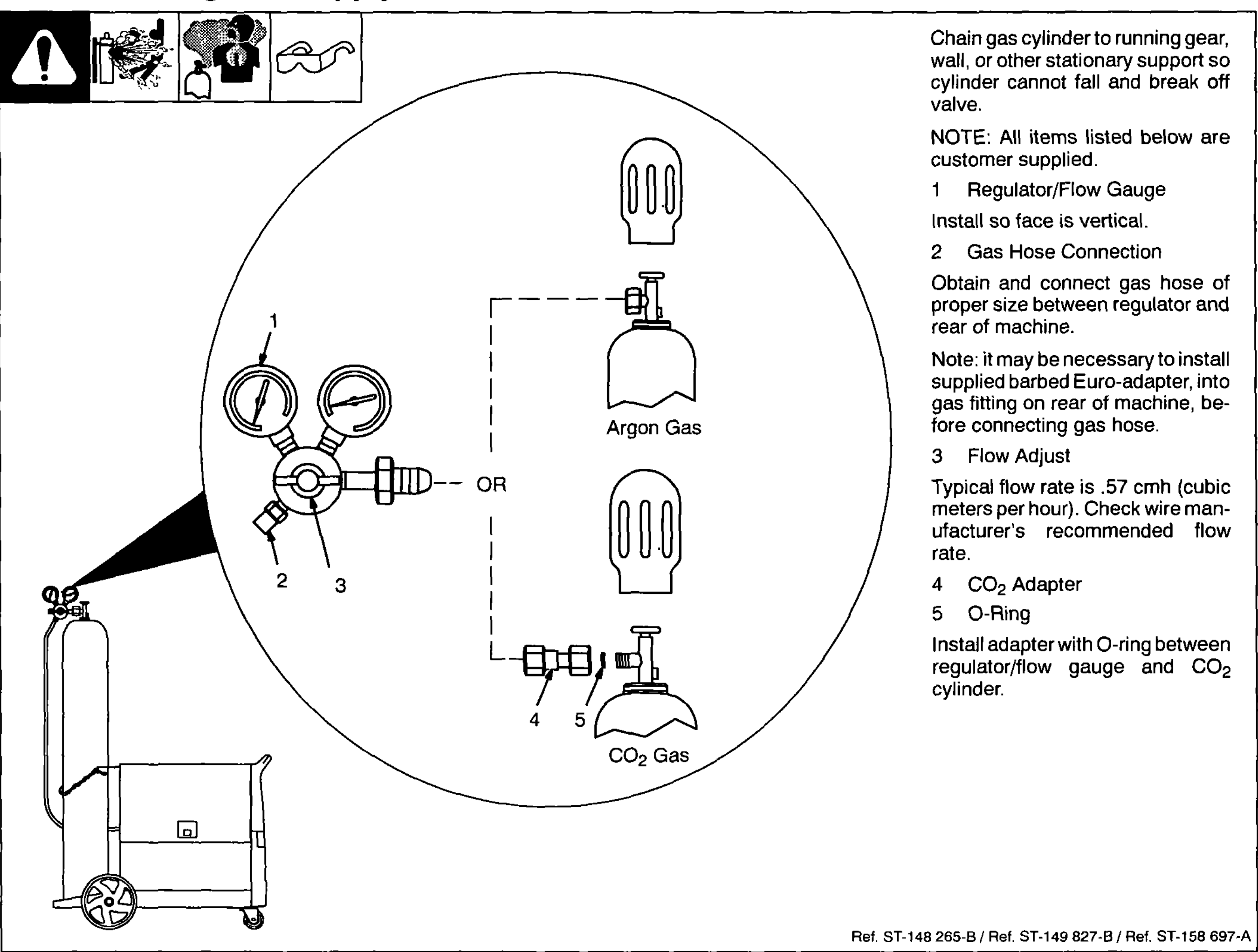
Always read and follow manufacture's recommended polarity.

2-7. Remote 14 Receptacle

	REMOTE 14	Socket*	Socket Information
Ref. ST-152 973-A	OUTPUT (CONTACTOR) FEEDER	A	24 volts ac. Protected by circuit breaker CB2.
		B	Contact closure to A completes 24 volts ac contactor control circuit.
		G	Circuit common for 24 and 115 volts ac circuits.

*The remaining sockets are not used.

2-8. Installing Gas Supply



Chain gas cylinder to running gear, wall, or other stationary support so cylinder cannot fall and break off valve.

NOTE: All items listed below are customer supplied.

1 Regulator/Flow Gauge

Install so face is vertical.

2 Gas Hose Connection

Obtain and connect gas hose of proper size between regulator and rear of machine.

Note: it may be necessary to install supplied barbed Euro-adapter, into gas fitting on rear of machine, before connecting gas hose.

3 Flow Adjust

Typical flow rate is .57 cmh (cubic meters per hour). Check wire manufacturer's recommended flow rate.

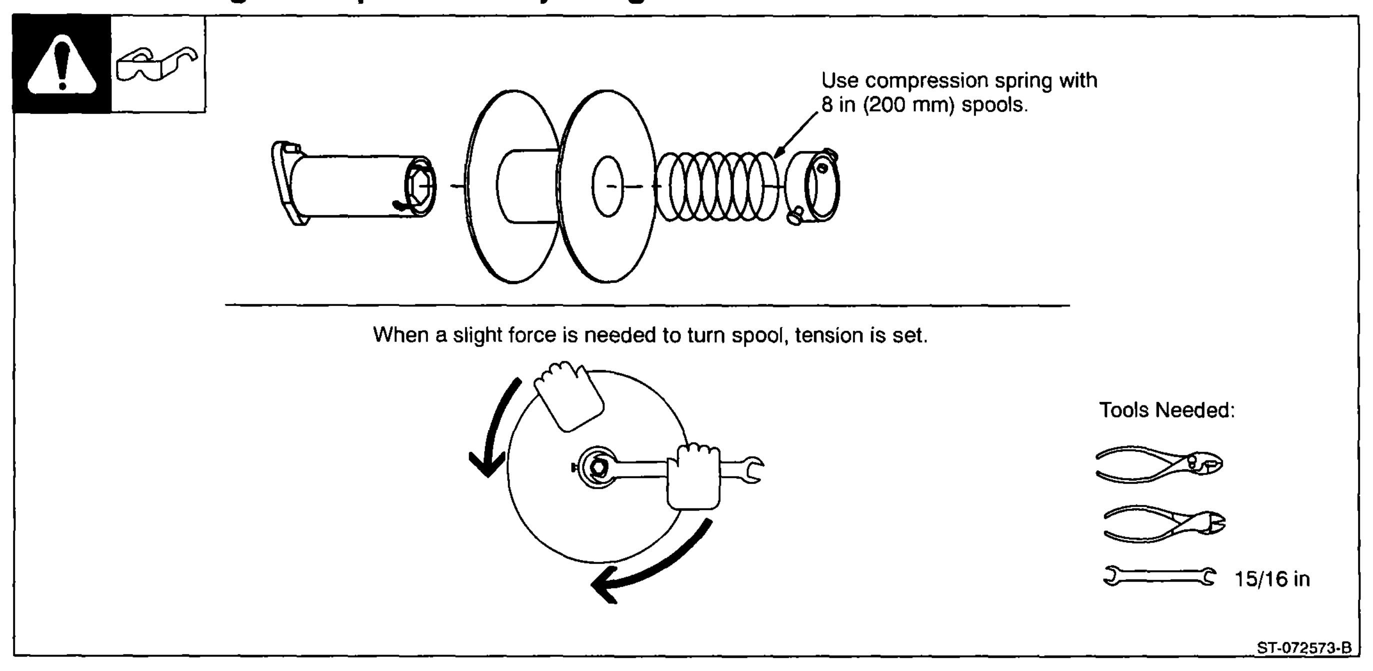
4 CO_2 Adapter

5 O-Ring

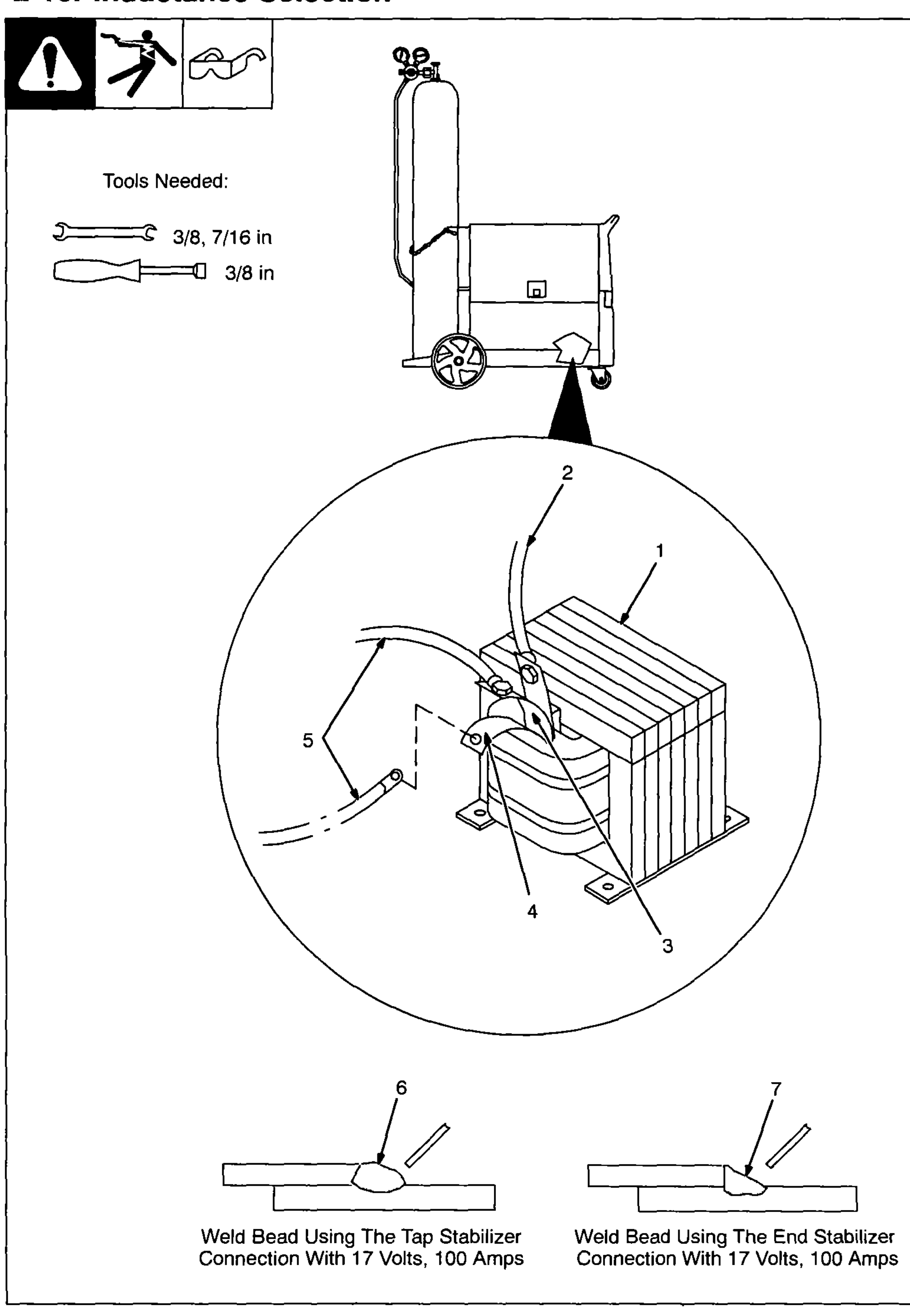
Install adapter with O-ring between regulator/flow gauge and CO_2 cylinder.

Ref. ST-148 265-B / Ref. ST-149 827-B / Ref. ST-158 697-A

2-9. Installing Wire Spool and Adjusting Hub Tension



2-10. Inductance Selection



Weld Bead Using The Tap Stabilizer Connection With 17 Volts, 100 Amps

Weld Bead Using The End Stabilizer Connection With 17 Volts, 100 Amps

Remove left side panel.

1 Stabilizer Z

Tapped stabilizer Z is factory connected to the stabilizer tap which suits most GMAW applications.

Stabilizer Z controls the inductance applied to the weld current. To increase inductance and wet out the weld puddle, connect to stabilizer Z ending.

To change inductance proceed as follows:

2 Lead 24

3 Stabilizer Z Tap

4 Stabilizer Z Ending

5 Lead 25

To decrease inductance, connect lead 25 to stabilizer tap and secure.

Reinstall side panel.

6 Typical Weld Bead Using The Tap Stabilizer Connection

Use the tap Stabilizer connection when welding with 100% CO_2 shielding gas.

Use either stabilizer connection, depending upon your arc preference, while welding with a mixed shielding gas.

Use stabilizer Z ending to weld on stainless steel.

7 Typical Weld Bead Using The End High Stabilizer Connection

Use the end Stabilizer connection to reduce weld bead crowning, and spread the weld puddle.

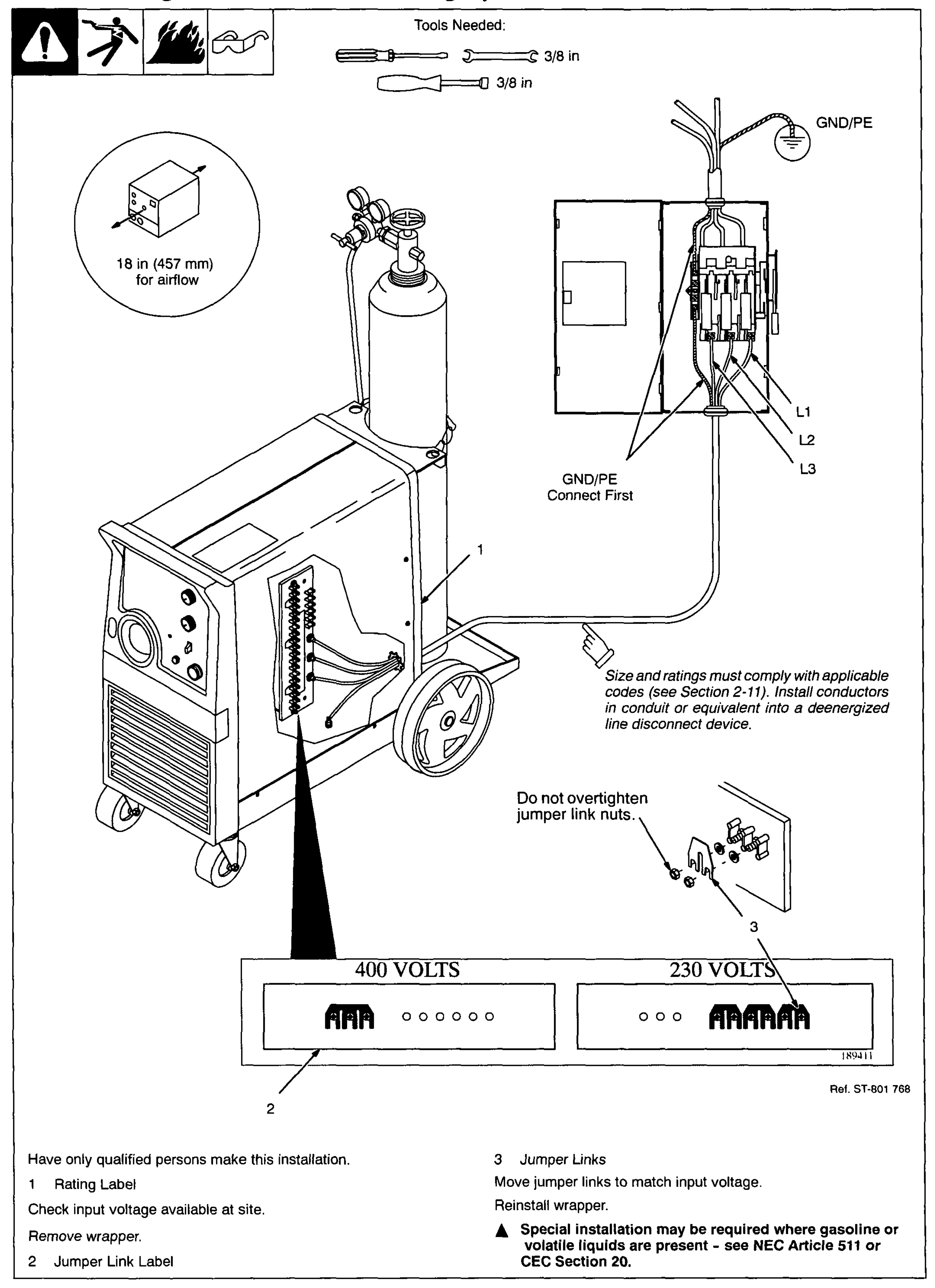
Install left side panel.

Ref. ST-148 265-B / Ref. ST-801 379-B

2-11. Electrical Service Guide

Input Voltage	230	400
Input Amperes At Rated Output	44.4	25.5
Max Recommended Standard Fuse Or Circuit Breaker Rating In Amperes	70	40
Min Input Conductor Size In AWG/Kcmil	8	10
Max Recommended Input Conductor Length In Feet (Meters)	128 (39)	259 (79)
Min Grounding Conductor Size In AWG/Kcmil	8	10
Reference: 1996 National Electrical Code (NEC)		

2-12. Selecting a Location and Connecting Input Power



Have only qualified persons make this installation.

1 Rating Label

Check input voltage available at site.

Remove wrapper.

2 Jumper Link Label

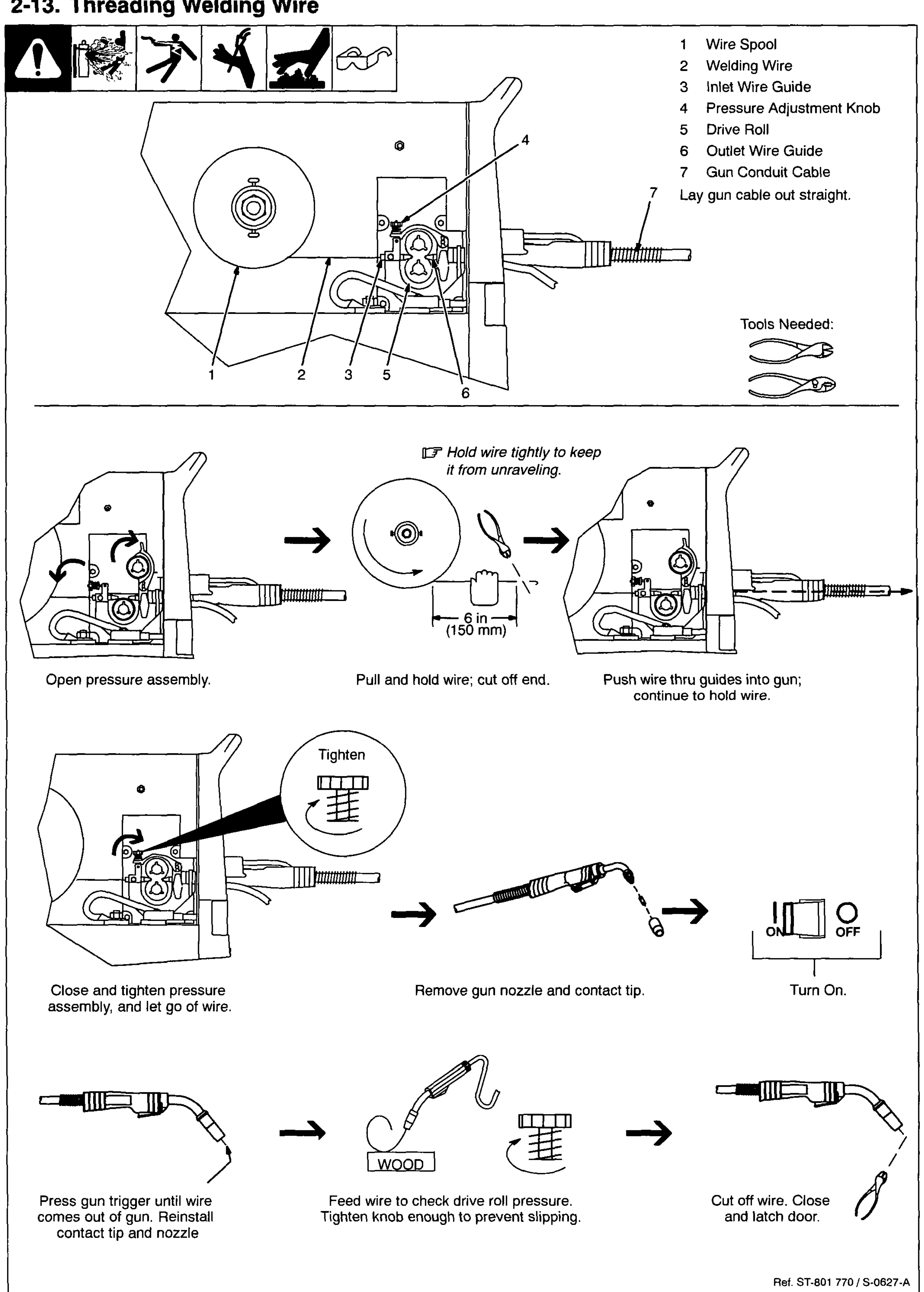
3 Jumper Links

Move jumper links to match input voltage.

Reinstall wrapper.

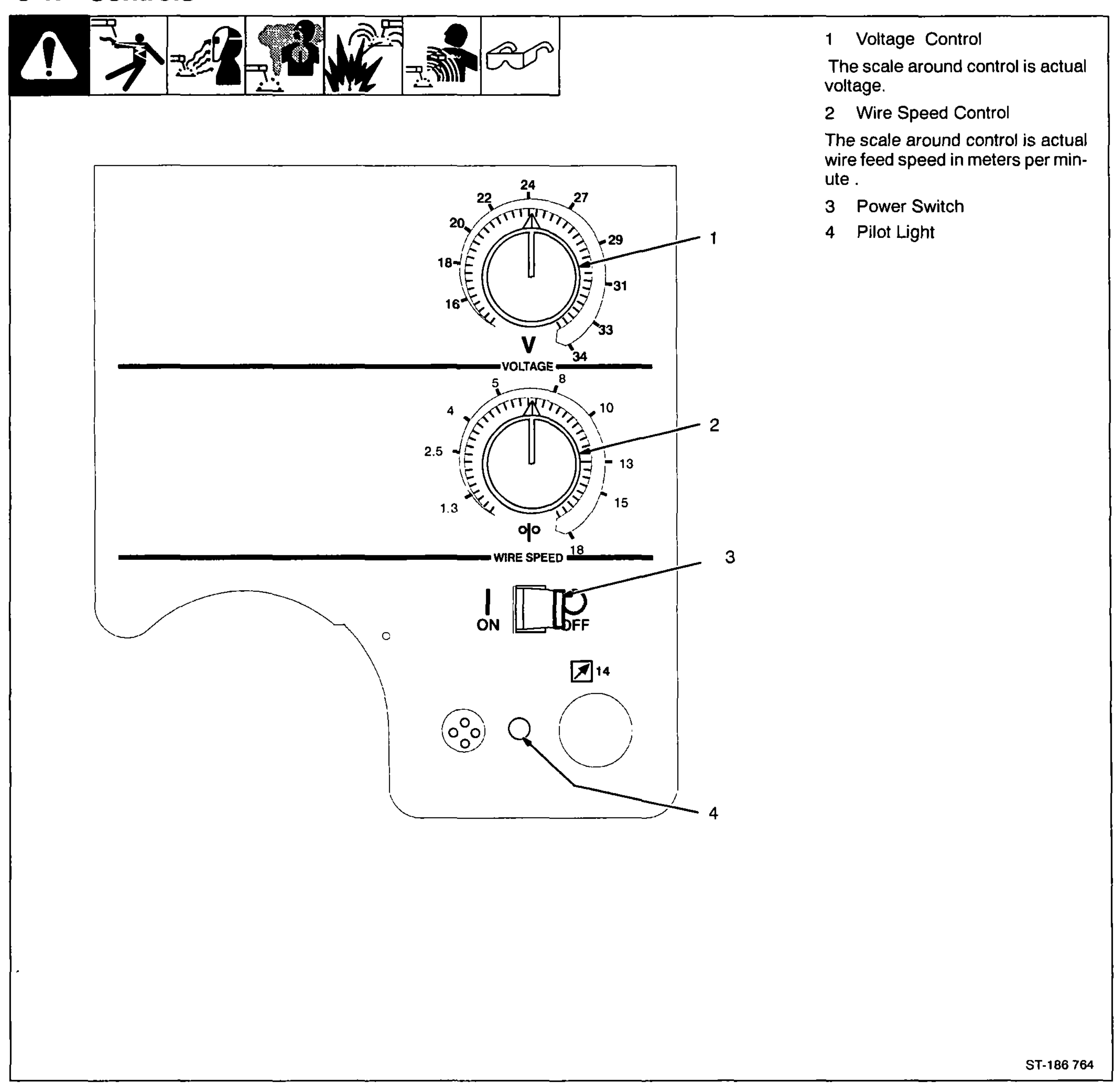
▲ **Special installation may be required where gasoline or volatile liquids are present - see NEC Article 511 or CEC Section 20.**

2-13. Threading Welding Wire



SECTION 3 - OPERATION

3-1. Controls



1 Voltage Control

The scale around control is actual voltage.

2 Wire Speed Control

The scale around control is actual wire feed speed in meters per minute .

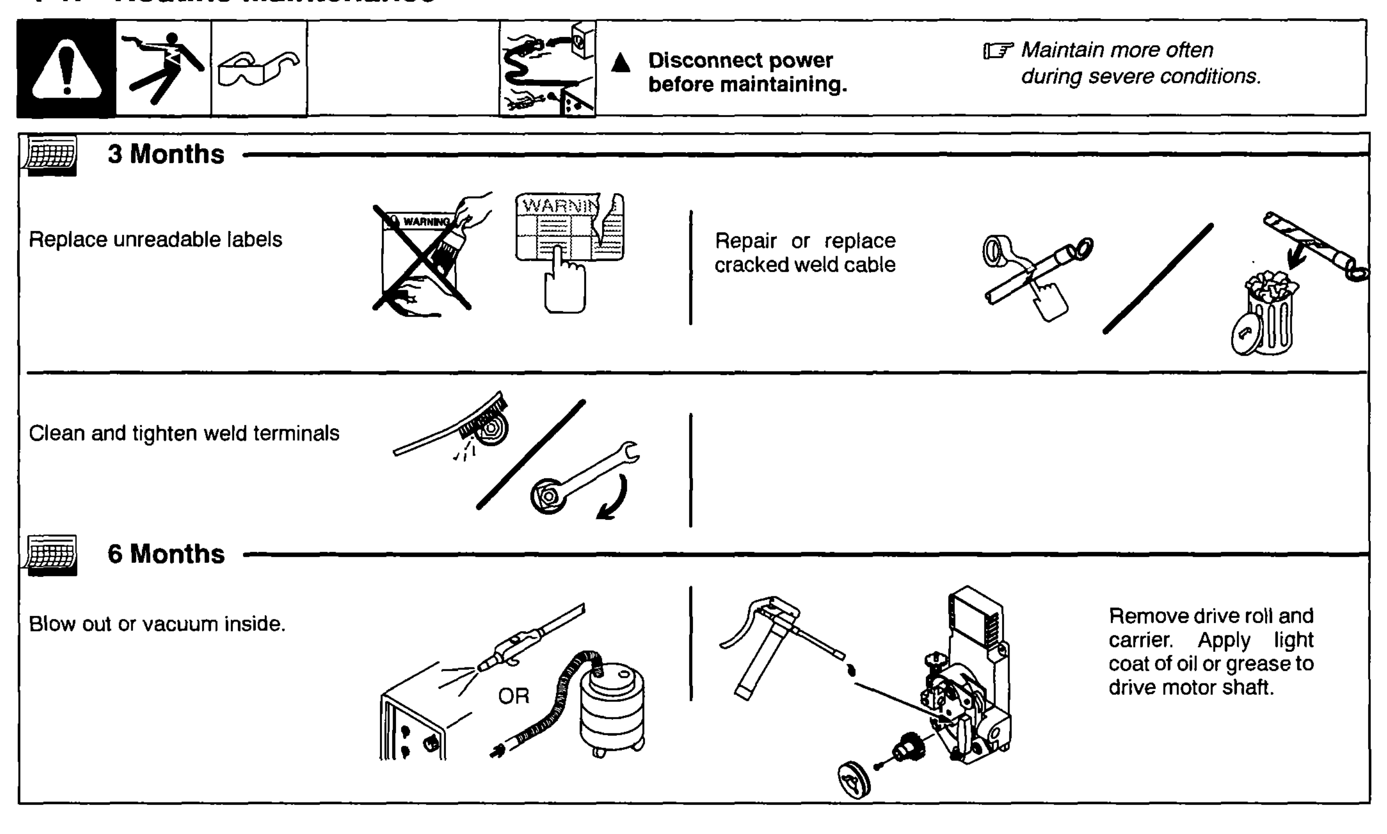
3 Power Switch

4 Pilot Light

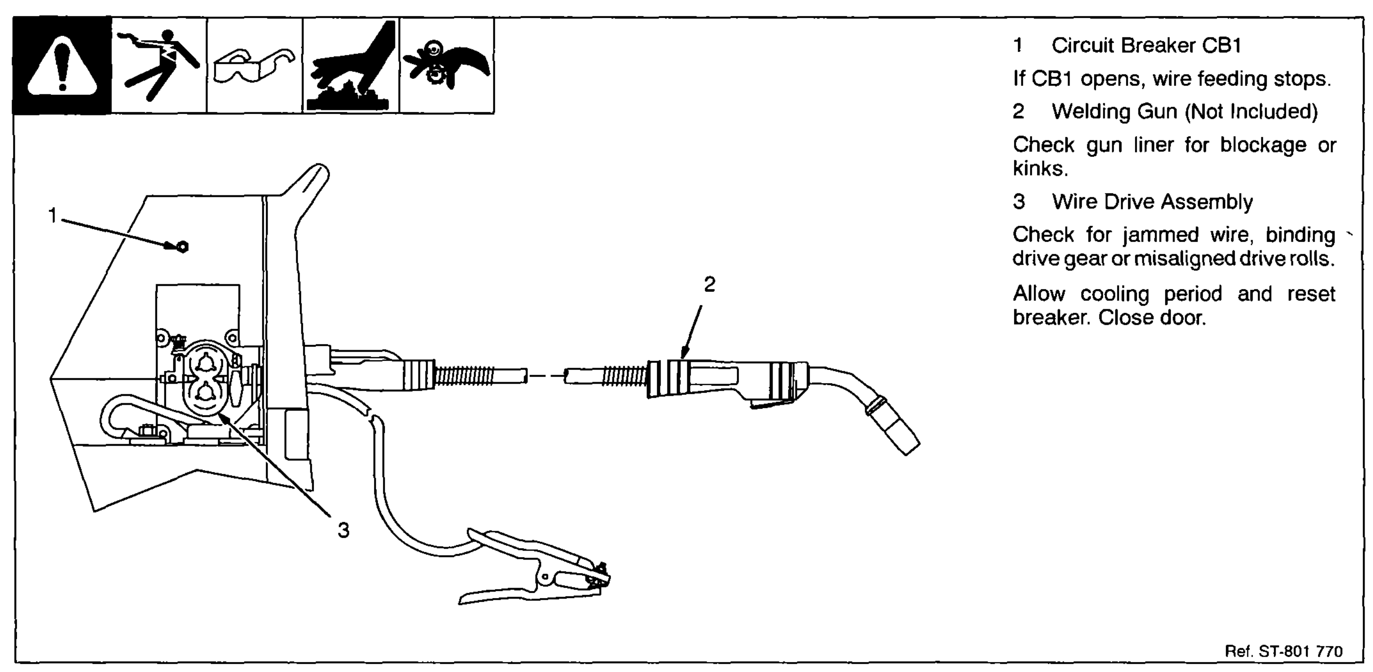
ST-186 764

SECTION 4 - MAINTENANCE &TROUBLESHOOTING

4-1. Routine Maintenance



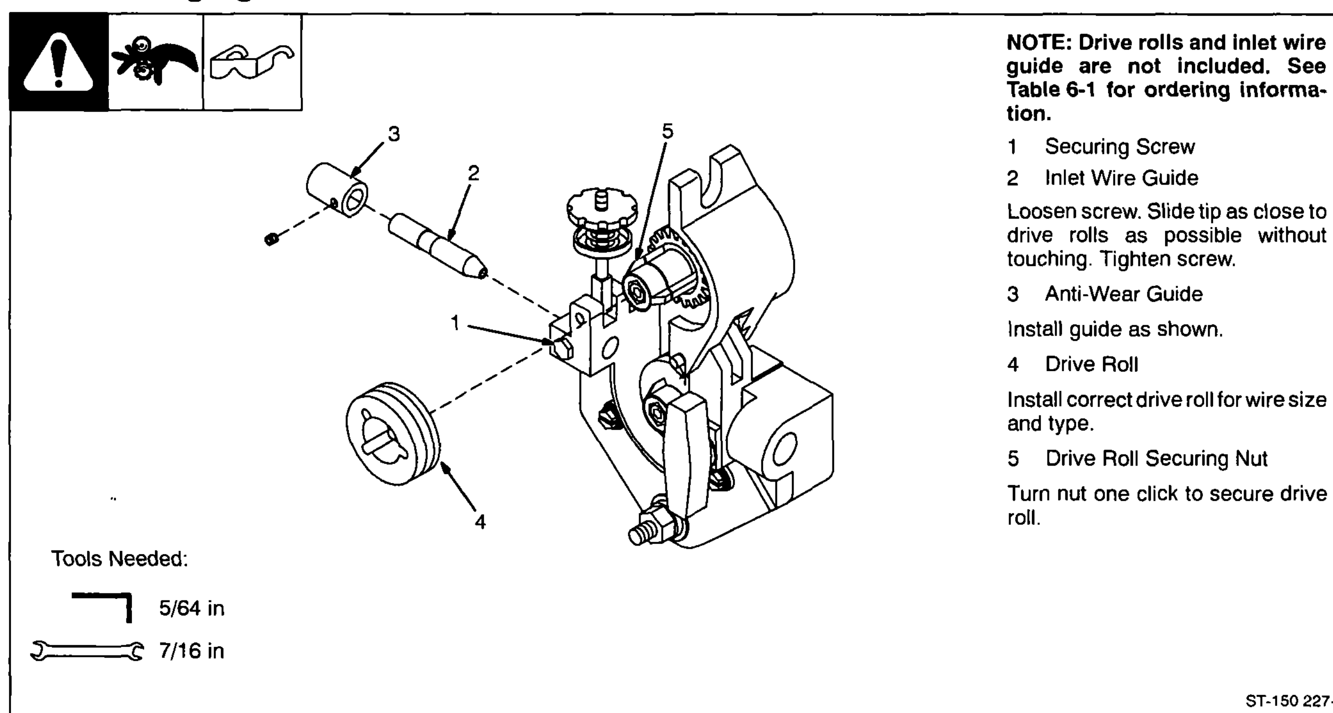
4-2. Circuit Breaker CB1



4-3. Unit Overload

If unit is used beyond capacity (excessive wire feed, shorted output, etc.), wire feeds but is not energized. Release gun trigger to reset this condition.

4-4. Changing Drive Roll and Wire Inlet Guide



NOTE: Drive rolls and inlet wire guide are not included. See Table 6-1 for ordering information.

1 Securing Screw

2 Inlet Wire Guide

Loosen screw. Slide tip as close to drive rolls as possible without touching. Tighten screw.

3 Anti-Wear Guide

Install guide as shown.

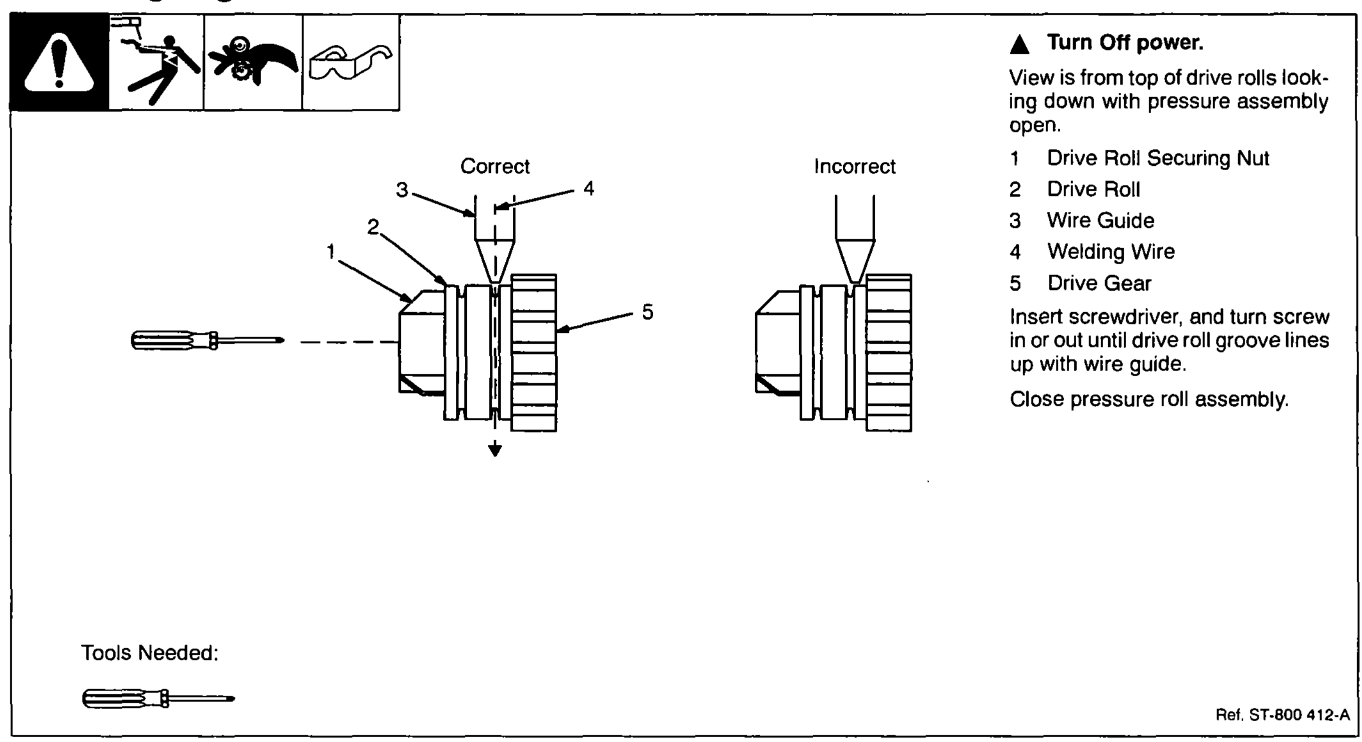
4 Drive Roll

Install correct drive roll for wire size and type.

5 Drive Roll Securing Nut

Turn nut one click to secure drive roll.

4-5. Aligning Drive Rolls and Wire Guide



▲ **Turn Off power.**

View is from top of drive rolls looking down with pressure assembly open.

1 Drive Roll Securing Nut

2 Drive Roll

3 Wire Guide

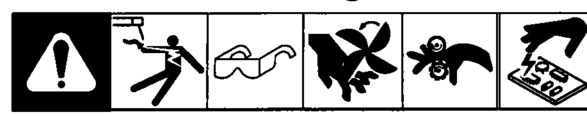
4 Welding Wire

5 Drive Gear

Insert screwdriver, and turn screw in or out until drive roll groove lines up with wire guide.

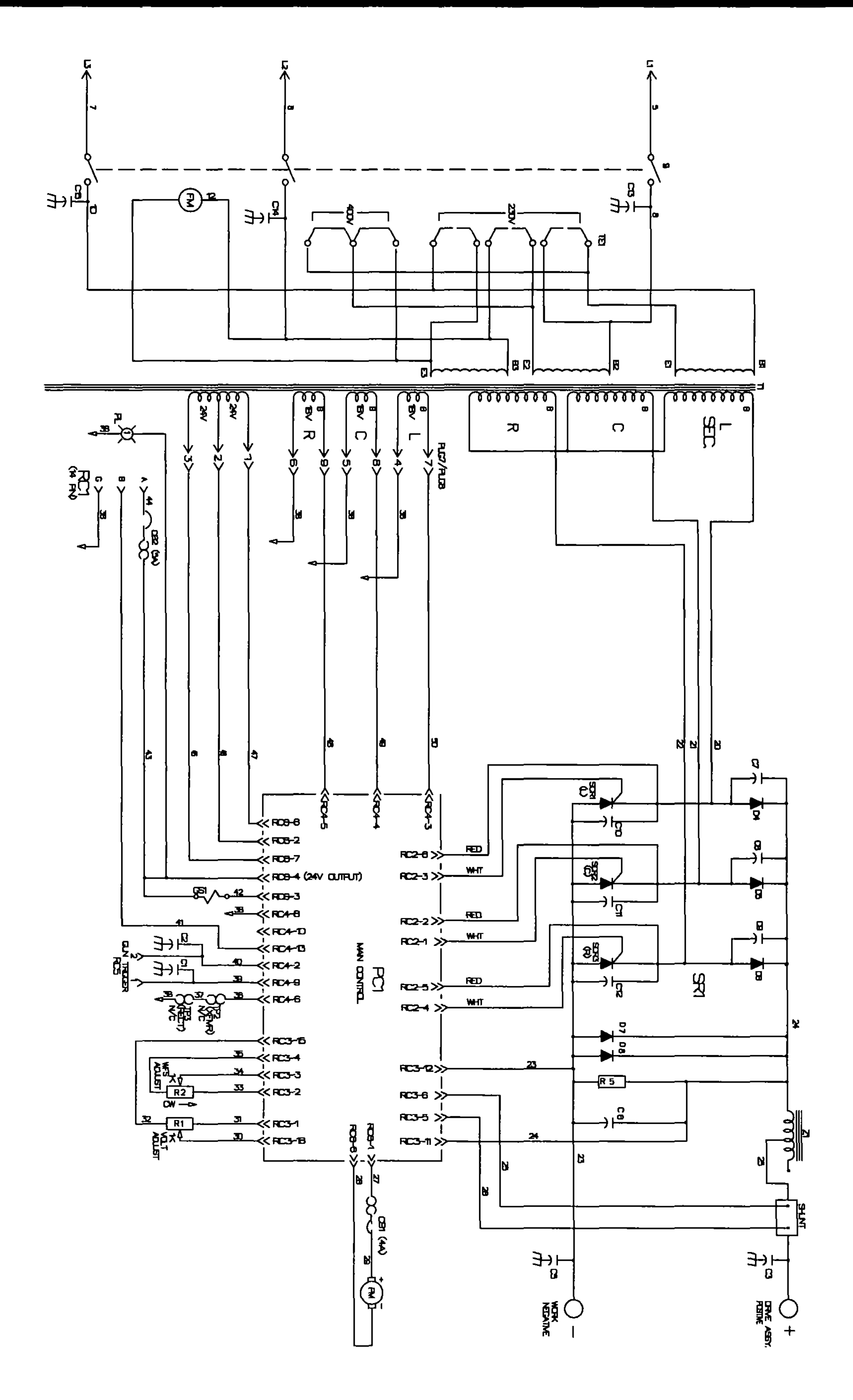
Close pressure roll assembly.

4-6. Troubleshooting



Trouble	Remedy
No weld output; wire does not feed.	Be sure line disconnect switch is On (see Section 2-12).
	Replace building line fuse or reset circuit breaker if open (see Section 2-12).
	Reset circuit breaker CB1 (see Section 4-2).
	Secure gun trigger connections (see Section 2-5, and see gun Owner's Manual).
	Have Factory Authorized Service Agent check Power switch.
	Have Factory Authorized Service Agent check all board connections and main control board.
No weld output; wire feeds.	Thermostat TP1 open (overheating). Allow fan to run; the thermostat will close when the unit has cooled (see Section 2-2).
	Connect work clamp to get good metal to metal contact.
	Replace contact tip (see gun Owner's Manual).
	An overload condition occurred. Release gun trigger (see Section 4-3).
	Have Factory Authorized Service Agent check main control board and main rectifier.
Low weld output.	Connect unit to proper input voltage or check for low line voltage (see Section 2-12).
	Check input voltage jumper links and correct position if necessary (see Section 2-12).
	Have Factory Authorized Service Agent check main control board.
Fan motor does not run.	Have Factory Authorized Service Agent check fan-on-demand circuit.
Low, high, or erratic wire speed.	Readjust front panel settings (see Section 3-1).
	Change to correct size drive rolls (see Section 4-4).
	Readjust drive roll pressure (see Section 2-13).
	Replace inlet guide, contact tip, and/or liner if necessary (see gun Owner's Manual).
	Check position of input jumper links (see Section 2-12).
	Have Factory Authorized Service Agent check main control board.
No wire feed.	Reset circuit breaker CB1 (see Section 4-2).
	Turn Wire Speed control to higher setting (see Section 3-1).
	Clear obstruction in gun contact tip or liner (see gun Owner's Manual).
	Readjust drive roll pressure (see Section 2-13).
	Change to correct size drive rolls (see Section 4-4).
	Rethread welding wire (see Section 2-13).
	Check gun trigger and leads. Repair or replace gun if necessary (see gun Owner's Manual).
	Have Factory Authorized Service Agent check main control board.

SECTION 5 - ELECTRICAL DIAGRAM

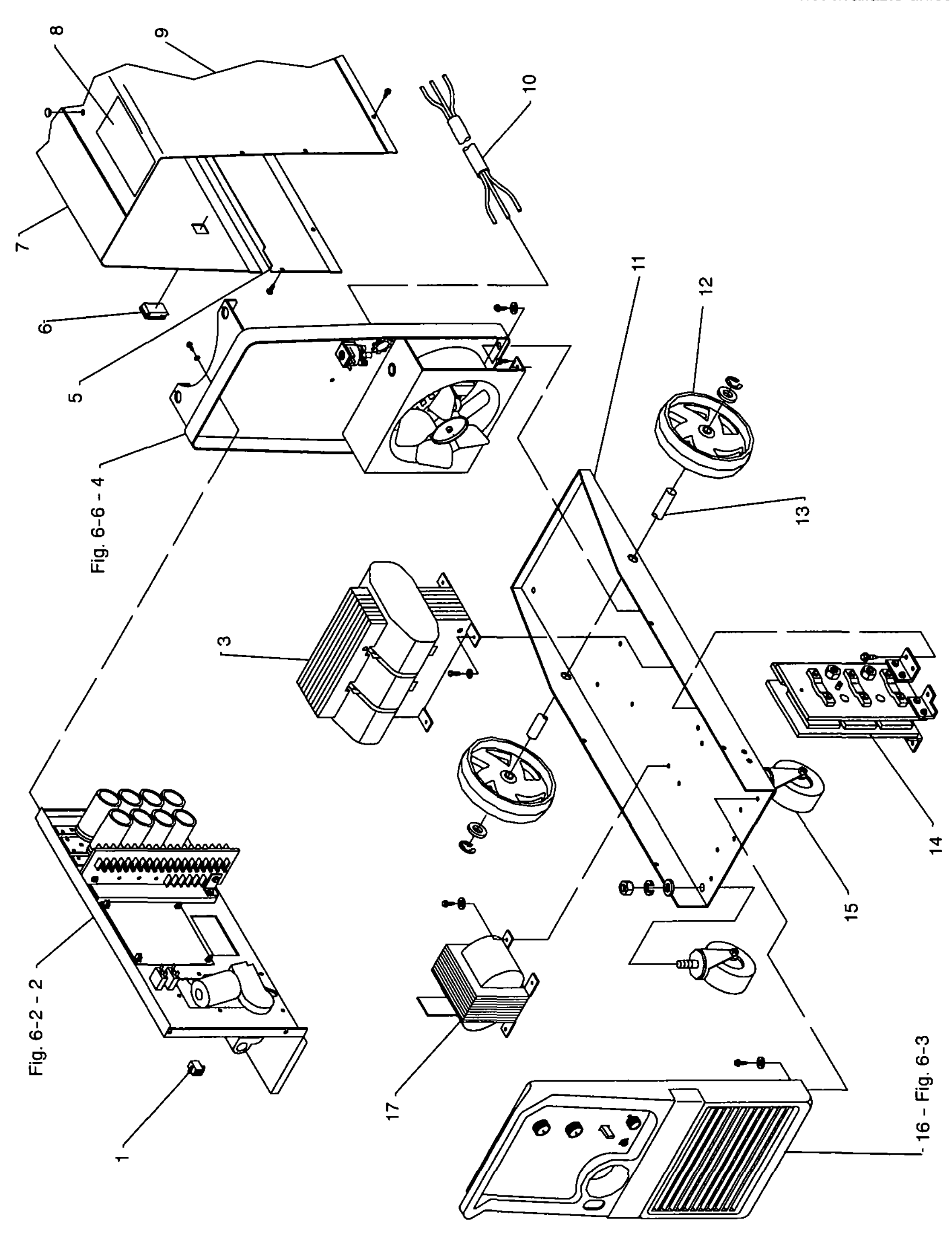


SD-189 410

Figure 5-1. Circuit Diagram

SECTION 6 - PARTS LIST

☞ *Hardware is common and not available unless listed.*



ST-802 104

Figure 6-1. Main Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 6-1. Main Assembly	
1	PLG8	008 072	HOUSING RECEPTACLE & SOCKETS	1
2		Fig 6-2	BAFFLE, center w/components	1
3	T1	189 414	TRANSFORMER, pwr main	1
	TP2	163 266	THERMOSTAT, NO	1
4		Fig 6-6	PANEL, rear w/components	1
5		146 165	PANEL, side LH	1
6		089 899	LATCH, slide flush mtg hole 1.000 wide x 1.500 lg	2
7		+146 167	PANEL, side	1
8		134 464	LABEL, warning general precautionary	1
9		+170 513	WRAPPER	1
10		187 804	CABLE, pwr 12ft 8ga 4/c	1
11		185 541	BASE	1
12		186 758	WHEEL	2
13		052 692	AXLE, running gear (consisting of)	1
		121 614	RING, retaining ext .750 shaft x .085grv depth	2
14	SR1	185 555	RECTIFIER, SCR main (consisting of)	1
	C7-12	031 689	CAPACITOR, rectifier	6
	SCR1-3	185 830	THYRISTOR, SCR 568A 400V	3
	TP3	171 600	THERMOSTAT, NC	1
	PLG2	115 093	CONNECTOR & SOCKETS	1
	D4-6	185 831	DIODE, rect 450A 200V	3
	D7,8	037 956	DIODE, rect 275A 300V	2
15		008 999	CASTER, plstc swvl 4 in dia	2
16		Fig 6-4	PANEL, front w/components	1
17	Z1	187 998	STABILIZER,	1
		130 750	CLAMP, ground 350A	1
		600 320	CABLE, weld cop strd No. 1 (order by ft)	10ft

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

☞ *Hardware is common and not available unless listed.*

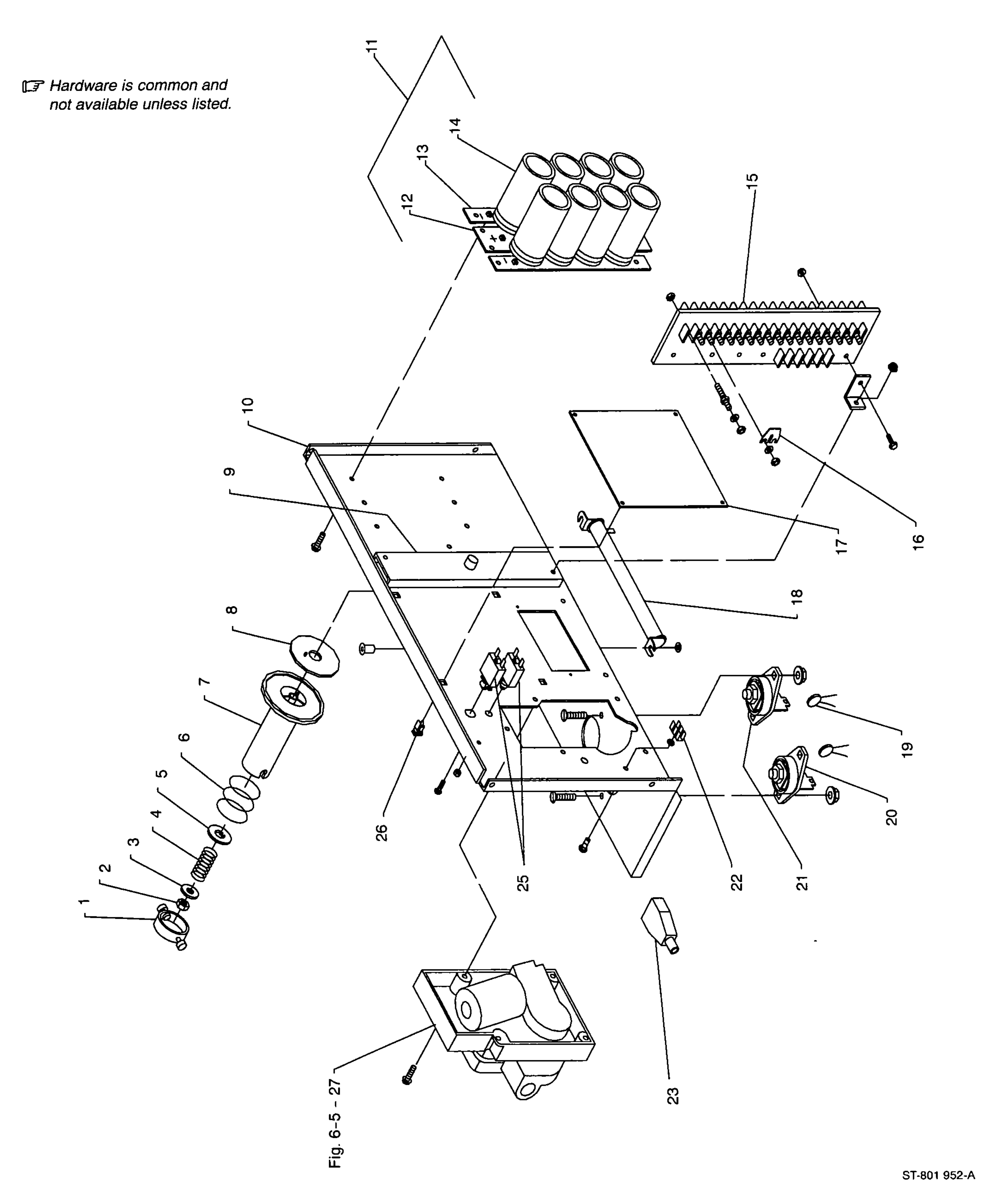


Figure 6-2. Baffle, Center w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 6-2. Baffle, Center w/Components (Fig 6-1 Item 2)

1		058 427	RING, retaining spool	1
2		085 980	NUT, stl hex full .625-11	1
3		605 941	WASHER, flat stl .640 ID x 1.000 OD x 14ga thk	1
4		186 437	SPRING, cprsn .845 OD x .110 wire x 1.500	1
5		057 971	WASHER, flat stl keyed 1.500dia x .125thk	1
6		057 745	SPRING, cprsn 2.430 OD x .090 wire x 2.500	1
7		186 435	HUB, spool	1
8		186 436	WASHER, brake	1
9		177 307	REEL, support	1
10		188 710	BAFFLE, center, (consisting of)	1
		184 965	COVER, primary board hole	1
11		186 998	CAPACITOR ASSEMBLY KIT, (consisting of)	1
12		082 902	STRIP, mtg center capacitor	1
13		185 643	STRIP, mtg capacitors	2
		083 147	GROMMET, scr No. 8/10 panel hole .312sq .500 high	6
14	C6	184 584	CAPACITOR, elctlt 15000uf 45VDC	8
		187 752	INSULATOR, capacitor	1
15	TE1	189 409	TERMINAL ASSEMBLY, pri 3ph two voltage	1
16		038 618	LINK, jumper term bd pri	3
17	PC1	184 331	CIRCUIT CARD, control main	1
	PLG3	131 052	HOUSING RECEPTACLE & SOCKETS	1
	PLG4	131 056	HOUSING RECEPTACLE & SOCKETS	1
	PLG6	115 092	HOUSING PLUG & SOCKETS	1
18	R5	119 998	RESISTOR, WW fxd 300W 5 ohm	1
19	C3,5	128 750	CAPACITOR	2
20	NEG	097 416	TERMINAL, pwr output black	1
21	POS	097 421	TERMINAL, pwr output red	1
		185 850	BUSS BAR, shunt	1
		141 567	SHUNT, meter 50V 400A	1
22		129 524	TERMINAL, frict male .250 x .032 3 pair	1
23		071 971	COVER, cable	1
25	CB1, CB2	180 912	CIRCUIT BREAKER, man reset 1P 5A 250VAC	2
26		134 201	STAND-OFF SUPPORT, PC card	4
27		Fig 6-5	WIRE DRIVE & GEARS	1

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 6-3. Panel, Front w/Components (Fig 6-1 Item 16)	
... 1		+188 711	PANEL, front control	1
		189 350	LABEL, nameplate	1
... 2	R2,3	035 897	POTENTIOMETER	2
... 3	C1	185 890	LEAD ASSEMBLY, elect	1
... 4	C2	185 896	LEAD ASSEMBLY, elect	1
... 5	C13-15	148 240	CAPACITOR, cer disc .003uf 2000VAC	3
... 6		186 473	PANEL, front	1
... 7	S1	128 756	SWITCH, tgl 3PST 40A 600VAC	1
... 8	RC5	048 282	RECEPTACLE w/SOCKETS	1
... 9	RC1	143 976	RECEPTACLE w/SOCKETS	1
... 10		186 470	PANEL, logo	1
... 11		186 472	PANEL, louver	1
... 12	PL1	157 958	LIGHT, ind white lens 28V	1
... 13		097 924	KNOB, pointer 1.625dia x .250 ID	2

Hardware is common and not available unless listed.

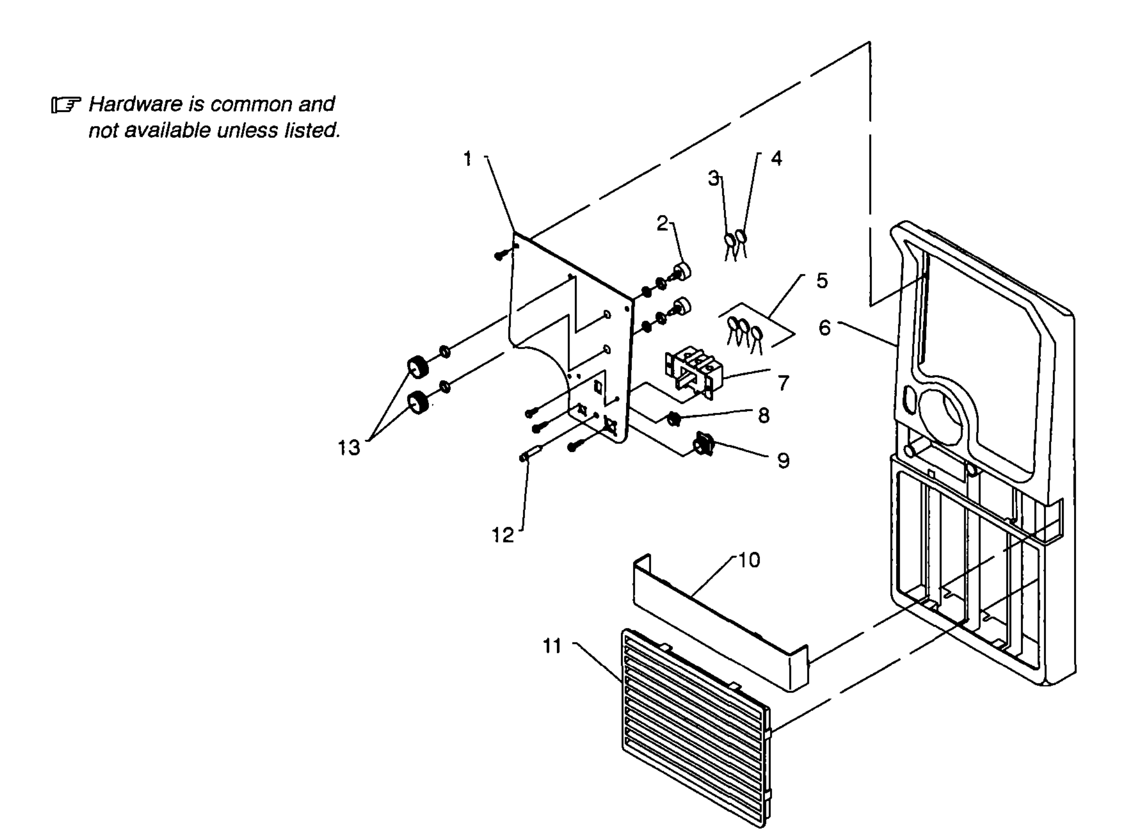


Figure 6-3. Panel, Front w/Components

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
Figure 6-4. Wire Drive And Gears (Fig 6-2 Item 27)				
1		602 009	SCREW, .250-20 x 1.25 soc hd gr 8	1
2		172 075	CARRIER, drive roll w/components	1
3		166 072	SPACER, gear	1
4		010 224	PIN, spring CS .187 x 1.000	1
5		182 788	HOUSING, adapter gun/feeder	1
6		085 242	FASTENER, pinned	1
7		085 244	WASHER, cupped stl .328 ID x .812 OD x .125 lip	1
8		010 231	SPRING, cprsn .770 OD x .105 wire x 1.225	1
9		085 243	KNOB, adj tension	1
10		166 071	LEVER, mtg pressure gear	1
11		079 634	PIN, hinge	1
12		151 828	PIN, cotter hair .054 x .750	2
13		173 616	COVER, right angle motor	1
14	PM	173 435	MOTOR, gear 24VDC 122RPM 20:1 ratio	1
15		079 633	FITTING, hose brs barbed M 3/16tbg	1
16		601 966	SCREW, .375-16 x 1.25hexhd	3
18		604 538	WASHER, flat stl SAE .312	1
19		124 778	KNOB, plstc T 1.000 lg x .312-18 x 2.000 bar	1
20		173 619	CARRIER, drive roll w/components	1
21		174 609	SCREW, M 4-.7 x 12	1
22		174 610	SCREW, M 6-1.0 x 20 soc hd	3
23		192 029	WASHER, flat .250 ID x .437 OD	3
24		173 620	BUSHING, motor mtg	3
		*045 233	GUIDE, anti-wear	1

See Table 6-1 Drive Roll & Wire Guide Kits.

Hardware is common and not available unless listed.

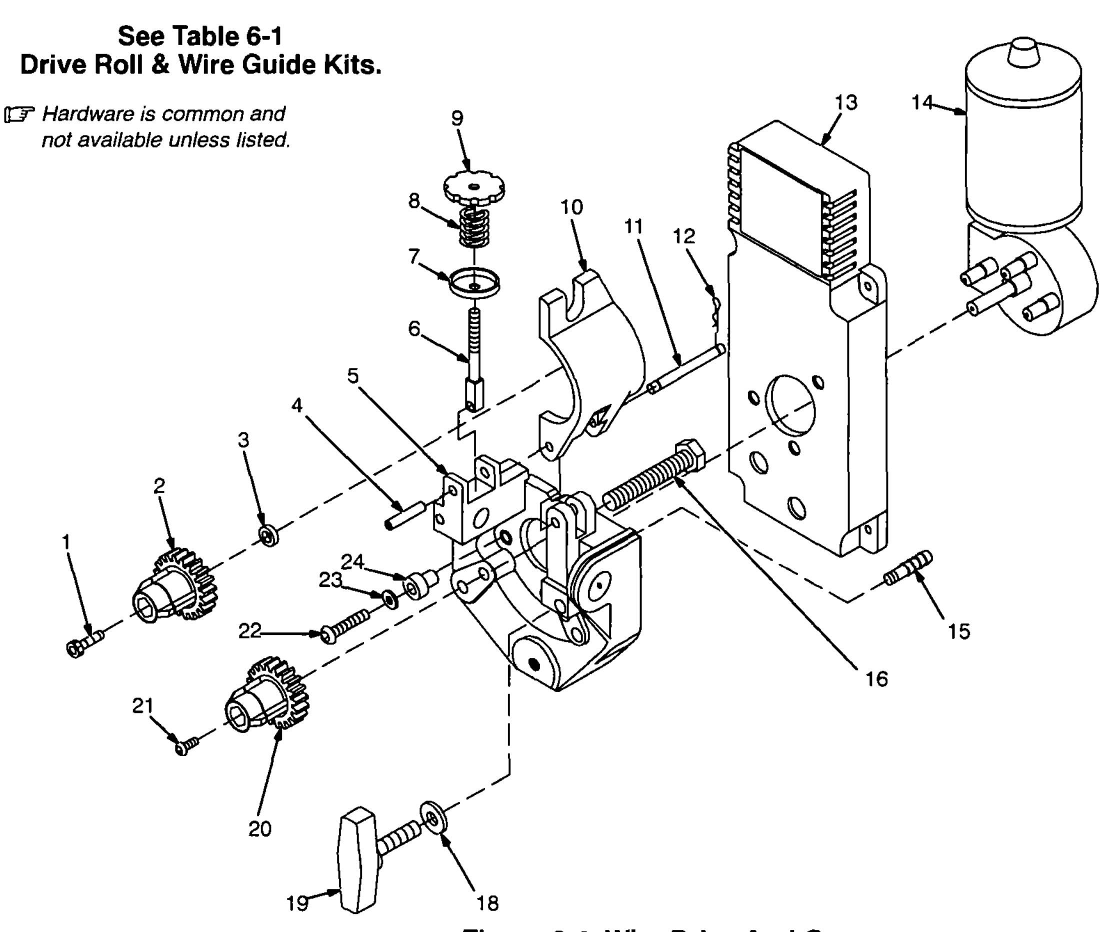


Figure 6-4. Wire Drive And Gears

*Recommended Spare Parts.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Table 6-1. Drive Roll And Wire Guide Kits

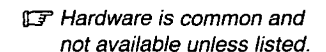
Note Base selection of drive rolls upon the following recommended usages:

1 V-Grooved rolls for hard wire.
2 U-Grooved rolls for soft and soft shelled cored wires.
3 U-Cogged rolls for extremely soft shelled wires (usually hard surfacing types).
4 V-Knurled rolls for hard shelled cored wires.
5 Drive roll types may be mixed to suit particular requirements (example: V-Knurled roll in combination with U-Grooved).

Wire Diameter			Kit No.	Drive Roll		Inlet Wire Guide
Fraction	Decimal	Metric		Part No.	Type	
.023/.025 in.	.023/.025 in.	0.6 mm	087 131	087 130	V-Grooved	056 192
.030 in.	.030 in.	0.8 mm	079 594	053 695	V-Grooved	056 192
.035 in.	.035 in.	0.9 mm	079 595	053 700	V-Grooved	056 192
.045 in.	.045 in.	1.2 mm	079 596	053 697	V-Grooved	056 193
.052 in.	.052	1.3 mm	079 597	053 698	V-Grooved	056 193
1/16 in.	.062	1.6 mm	079 598	053 699	V-Grooved	056 195

Ref. S-0026-B/7-91

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 6-5. Panel, Rear w/Components (Fig 6-1 Item 4)	
1		049 399	NUT, speed push-on-type .312 stud .625 OD x .456 ID	1
2		148 809	BLADE, fan 9 in 5wg 34deg .309 bore CCW	1
3	FM1	148 808	MOTOR, fan 230V 1550RPM .312dia shaft	1
4		188 709	WINDTUNNEL	1
5	GS1	125 785	VALVE, 24VAC 2 way custom port 1/8 orf	1
6		143 810	PANEL, rear	1
7		169 654	BRACKET, support tank	1
8		602 387	CHAIN, weldless 2/0 x 27.000 lg	1
9		605 227	NUT, nyl hex jam .750NPST	1
10		178 126	CONNECTOR, clamp cable .690/1.070	1


Hardware is common and not available unless listed.

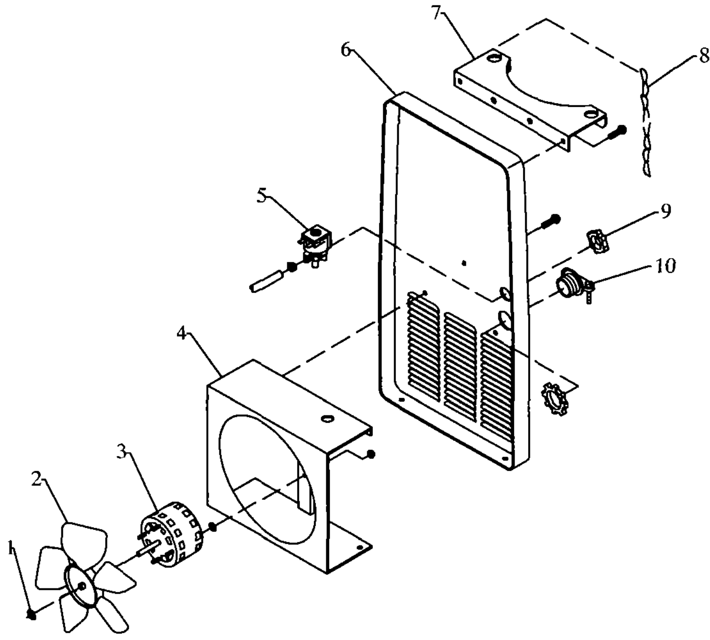


Figure 6-5. Panel, Rear w/Components

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.



Effective January 1, 1998
(Equipment with a serial number preface of "KJ" or newer)

This limited warranty supersedes all previous Miller warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY - Subject to the terms and conditions below, Miller Electric Mfg. Co., Appleton, Wisconsin, warrants to its original retail purchaser that new Miller equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Miller. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Miller must be notified in writing within thirty (30) days of such defect or failure, at which time Miller will provide instructions on the warranty claim procedures to be followed.

Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the date that the equipment was delivered to the original retail purchaser, or one year after the equipment is sent to a North American distributor or eighteen months after the equipment is sent to an International distributor.

1. 5 Years Parts - 3 Years Labor
   * Original main power rectifiers
   * Inverters (input and output rectifiers only)
2. 3 Years — Parts and Labor
   * Transformer/Rectifier Power Sources
   * Plasma Arc Cutting Power Sources
   * Semi-Automatic and Automatic Wire Feeders
   * Inverter Power Supplies
   * Intellitig
   * Engine Driven Welding Generators
     (NOTE: Engines are warranted separately by the engine manufacturer.)
3. 1 Year — Parts and Labor
   * Motor Driven Guns (w/exception of Spoolmate 185)
   * Process Controllers
   * Positioners and Controllers
   * Automatic Motion Devices
   * Robots
   * IHPS Power Sources
   * Water Coolant Systems
   * HF Units
   * Grids
   * Spot Welders
   * Load Banks
   * SDX Transformers
   * Miller Cyclomatic Equipment
   * Running Gear/Trailers
   * Plasma Cutting Torches (except APT, ZIPCUT & PLAZCUT Models)
   * Deutz Engines (outside North America)
   * Field Options
     (NOTE: Field options are covered under True Blue® for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
4. 6 Months — Batteries
5. 90 Days — Parts and Labor
   * MIG Guns/TIG Torches
   * APT, ZIPCUT & PLAZCUT Model Plasma Cutting Torches
   * Remote Controls
   * Accessory Kits
   * Replacement Parts (No labor)
   * Spoolmate 185

Miller's True Blue® Limited Warranty shall not apply to:

1. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
2. Consumable components; such as contact tips, cutting nozzles, contactors, brushes, slip rings, relays or parts that fail due to normal wear.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

MILLER PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL/INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at Miller's option: (1) repair; or (2) replacement; or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. Miller's option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a Miller authorized service facility as determined by Miller. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

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Owner's Record

Please complete and retain with your personal records.

Model Name	**Serial/Style Number**
Purchase Date	(Date which equipment was delivered to original customer.)
Distributor	
Address	
City	
State	**Zip**



Resources Available

Always provide Model Name and Serial/Style Number.

Contact your Distributor for:

To locate distributor nearest you call 1-800-4-A-Miller.

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